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JOURNAL OF EDUCATIONAL RESEARCH MONOGRAPHS

NUMBER TWO

**A Study of Some High School
Seniors of Superior Intelligence**

YATES

JOURNAL OF EDUCATIONAL RESEARCH MONOGRAPHS

No. 2

B. R. BUCKINGHAM, *Editor*

June, 1922

A Study of Some High School Seniors of Superior Intelligence

DOROTHY HAZELTINE YATES, Ph. D.

Member of the Stanford University Research Staff for the
Study of Gifted Children

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Dr. Virgil E. Dickson, Director of the Oakland Department of Research and Guidance, made both studies possible through his cooperation. And Professor Terman of Stanford University kindly assisted by giving his advice and by lending some unpublished comparative data.

D. H. Y.

*University of California,
Berkeley, California,
May, 1921.*

EDITOR'S INTRODUCTION

It is becoming a commonplace to say that our school system fails to detect and to furnish adequate training for the capable child. A certain doctrine, fortifying itself with the name of democracy, shrinks from the fundamental fact of individual differences and deprecates in the name of equality anything but a uniform treatment of school children. This doctrine is false and is based upon a faulty conception of democracy. The evidence that men are not born equal is conclusive. If, then, the fact of differences—many, varied, and wide—is accepted (as indeed it must be by anyone who approaches the facts with an open mind) then the corollary that training should be different must also be accepted. Nor does this acceptance of differentiated training relate solely or mainly to gifted children. “The world’s best brains fully trained” is only a partial program which should be replaced by the wider program “everybody’s brains fully trained.”

In this monograph the author brings into sharp relief the superior child. The “Child Study” of an earlier day, under the influence of the tendency to specialization which is so generally evident, has been broken up into the intensive study of types of children; and among these none is so attractive as the superior type.

Means for detecting children of this type and an analysis of their characteristics are surely important educational considerations. “To do justice to superiority we must understand it.” The reader will seek and find in the following treatment a better understanding of this superiority. Whether it will enable him to do justice to superior children will depend upon his ability to use this knowledge.

At any rate, there is no virtue in ignorance. There are gifted children in every school system. The author takes us into one of

these systems and describes in minute detail the sort of superior children she found. We do not propose in this introduction to anticipate her in the treatment of her material.

One thing, however, stands out in the entire discussion, namely, the all-around superiority of the capable child selected on the basis of intelligence testing. For example, according to the data here presented the superior child is in the matter of interest always at an advantage. He not only has keener and more vitalizing interests, but he has more of them. Moreover, he makes greater effort, is more socially adaptable, and possesses higher qualities of leadership. In short, he is superior.

B. R. BUCKINGHAM, *Editor*.

April 30, 1922.

CHAPTER I

INTRODUCTION

Compared with the extensive literature on the subject of subnormal intelligence that which has been written about super-normal intelligence seems remarkably scant. The latter has commonly been discussed in three typical ways: first, in treatises on genius, collectively considered, such as Galton's *Hereditary Genius* (3),¹ Lombroso's *The Man of Genius* (5), and Havelock Ellis' *British Genius* (2); second, in accounts of child prodigies, like Winifred Stoner (8), Karl Witte (12), and William James Sidis (11); and third, in sporadic short articles which are for the most part pleas for the bright children in the schools (1). Prodigies and geniuses appear infrequently, but in nearly every school there are some pupils who are decidedly above the average in intelligence. Is it not possible that these bright children deserve more attention than they are now getting?

Practically nothing has been done for exceptionally intelligent pupils except in some cases to provide a more flexible system of promotion. In 1915 McDonald (6) gathered information on this question from the public schools of this country. He gives a list of twenty-two cities that reported special classes for exceptionally intelligent children. Two years later Miss Elizabeth Woods (13) found that forty-five cities had classes formed of superior children only. Whipple (10) and Henry (4) consider these statements gross overestimates; for upon investigating some of the cases cited by McDonald, they learned that one city "only occasionally promoted individual pupils; one had a room for dull but never for bright children; one had a 'mixed' room for both dull and gifted (!); and two gave individual coaching to pupils who were trying for special promotions." Miss Woods (13) herself complains that the so-called "flexible promotion," in its various forms, was imperfectly developed and insufficiently applied; that "superior" teachers of special classes were almost never really

¹ Bibliographical references are given at the end of each chapter.



classes, i.e., those who would make up the upper and lower senior classes the following semester, when the detailed studies of individuals were to be carried on. Both "high" and "low" grades were included in order to have a larger group from which to select. The fifty pupils who ranked highest in these first tests, and seventeen others who were recommended by their teachers as pupils of exceptional intelligence, were retested during May and June by means of the Stanford Group Test, the two parts of which were given on different days. To determine the "control group" the same test was also given to fifty-four whose Army Alpha or Otis scores lay at, or close to, the medians. With the Stanford test the time allowance was so generous as to be practically unlimited for a fairly quick worker. It gave opportunity, therefore, to the slower pupils.

Before the Stanford test was given the teachers had been asked to name any pupils in the grades under consideration whom they regarded as unusually bright. The list thus obtained was helpful in various ways. It reinforced the verdict of the preliminary tests because it included most of those excelling therein. It also brought to light four promising subjects who had been absent during the first tests.² And lastly, it contained the names of thirteen whose earlier mental ratings lay below the highest fifty. When these students were retested by the Stanford test, only one (Number 25, Table I) made a score high enough to warrant her inclusion in the group of the twenty-five brightest. As might be supposed, all the young people on the teachers' list had conspicuously high scholarship records. High-school teachers often have little time or opportunity to know many of their pupils well, so it is not surprising that they sometimes mistake school-room achievement, due largely to extraordinary application, for intellectual superiority. That is why the mental test, which is impersonal and carefully standardized, was taken as the only basis of selection in this study. There seemed to be no better criterion for the purpose. Not that we wish to claim too much for such tests. Doubtless they fail to give evidence of some phases of intellectual excellence. However, the superior pupils selected certainly rank high in the mental abilities that the tests measure.

² Number 1 in the superior group (see Table I) was discovered in this way.

The groups studied consist, then, of the best twenty-five, and the twenty-five nearest the median, selected by means of two group tests,³ the longer of which was administered with a generous time allotment. Goddard (1) estimates that about four percent of the children in the public schools are so superior to the average child as to demand special educational opportunities. Our group of twenty-five superiors is a little less than four percent (3.8 percent) of the senior class, which in itself is a highly selected group. It should be added that four subjects whose first tests indicated that the performers would probably find a place in the superior group, could not, for one reason or another, be studied further.

When the personnel of the superior and control groups had been determined, the high-school records were consulted and all available data gathered. Besides this, as many teachers as possible were asked to give their estimate of each pupil's intelligence, and to rate each one in various mental, moral, and physical traits. This was done in personal conference with the investigator.

Next a questionnaire dealing primarily with interests was given to every young person individually by the writer herself. At the same time an attempt was made to secure the pupil's friendly cooperation. Moreover, it was stated at the beginning of the questionnaire that the investigator would be willing to give "a brief analysis of your mentality and indicate the kinds of work at which you will probably best succeed." This invitation was intended to serve somewhat as "bait." Twelve of the superior group and three of the control group asked for interviews, which, of course, furnished an excellent opportunity for studying the pupils and supplementing or correcting data. The writer also made it a point to have personal talks with the rest of the young people, either in their own homes or elsewhere. For the most part, the superior group was very friendly and interested. This was less true of the control group, in spite of the fact that any suggestion of their lesser ability was carefully avoided. Getting back their questionnaires sometimes proved an arduous task. In the end, however, remarkably complete data were obtained from both groups, and the writer is much indebted to her fifty young friends—for such they became—for their careful and detailed replies.

³ See Chapter III for one partial exception.

Thanks are also due to the parents for their candid and courteous response to an appeal for a great deal of information. During home visits that lasted two or three hours or more, the writer filled out special blanks calling for information as to the immediate family and ancestry, the young person's physical development and health, mental development and educational history, his interests, traits, and special abilities, his home surroundings, duties, or other occupations, etc., etc. The present study attempts to discuss briefly only the more important findings. Forty-seven mothers, nine fathers, and one foster-mother were interviewed, and various other relatives made some contributions. One mother, who was out of town for a protracted stay, sent a complete report by mail.

No case was retained in the groups as they finally stood unless full and satisfactory data were obtainable. Evidence based on specific details not general descriptive terms was the only kind accepted. There were written records—in the form of "baby-books"—for ten. Most of the parents apparently gave unbiased and fairly accurate accounts. Since information on certain points was obtained from several other sources—e.g., from teachers, school records, or the young people themselves—it was easy to check the general accuracy of parents' reports. In this way two mothers of pupils in the control group were found to have given rather unreliable testimony. Where this affects our conclusions attention will be called to the matter. The parents of the brighter pupils were almost always reluctant to stress their own children's superiority. The tendency seemed to be to underestimate rather than the reverse.

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- (1) Goddard, H. H., "Two Thousand Children Measured by the Binet Measuring Scale of Intelligence," *Pedagogical Seminary*, 18: 232-259, June, 1911.

CHAPTER III

THE NATURE OF THE TWO GROUPS SELECTED

Mental-test ratings.—Table I shows that only one of the seventeen superiors who took the Army test scored lower than 156, the highest score being 191. It will be remembered that the greatest number of points attainable is 212, from 135 points to 212 being rated class A, or "very superior," in the Surgeon General's report (6), and from 105 to 134, class B, or "superior." Since the scores of our control group ranged from 106 to 120 (see Table II), even this group is superior with respect to the general population. The control group is "average" in the sense of "average for high-school seniors." The median score of the 537 given the Army test was found to be 119. Those just below, rather than above, the median were chosen for retesting by the Stanford test, because the tendency is to do better in a test with a wide time limit.

The intention had been to give all the pupils the Army test, but crowded conditions in the schools prevented further large-group testing. The Otis test (Oakland edition), which had already been given to 127 "low" seniors, is so similar as to be quite satisfactorily evaluated in terms of the Army test. Since, however, the latter differs in having more "spread" in the upper part of the scale, it differentiates superiority more sharply. The Otis test ratings of the eight who were included in the superior group ranged from 149 to 163 (out of a possible 172) points. The five pupils finally selected for the control group had scores ranging from 108 to 115. The scores of these five pupils may be compared with a median of 116 which was available from previous testing.

In the Stanford test the range for the superior group was from 302 to 346 (out of 366), the scores being fairly evenly distributed between these points. The pupils are listed in the order of their rank from the highest to the lowest, on the basis of the total number of points gained in both tests (i.e., in the Army or Otis on the one hand and in the Stanford on the other hand). A method of ranking depending simply on the addition of the two scores is,

of course, rather crude, and must not be taken too seriously. For instance, very high achievement at one time might be preceded or

TABLE I. SUPERIOR GROUP: MENTAL-TEST RATINGS, HIGH-SCHOOL MARKS, AND TEACHERS' ESTIMATES OF INTELLIGENCE

(Girls' numbers are printed with an * following)

PUPIL'S NUMBER	SENIOR GRADE	ARMY ALPHA TEST	OTIS GROUP TEST	STAN- FORD GROUP TEST	AVERAGE OF HIGH- SCHOOL MARKS	TEACHERS' ESTIMATE OF INTEL- LIGENCE	COURSE
1	A	191	.....	333	1-	1	College Prep.
2	B	.....	155	346	2+	1-	" "
3	B	.....	163	337	1-	1-	" "
4	B	.....	149	341	2+	1-	" "
5	A	172	.....	337	1-	1-	" "
6	A	171	.....	335	1-	2+	" "
7	A	178	.....	319	2-	2	" "
8*	A	165	.....	330	1	1	" "
9*	B	173	.....	321	1-	1	" "
10	A	.....	158	327	1	1	" "
11	A	166	.....	327	1-	1-	" "
12	B	.....	157	325	2-	2-	" "
13	B	.....	149	333	2-	3+	" "
14*	A	167	.....	317½	2-	2	" "
15*	A	172	.....	312	2+	2	General
16*	A	160	.....	321	2+	2	Normal Prep.
17	B	.....	148	321	2-	1-	College Prep.
18	B	156	.....	321	2	2+	" "
19	A	166	.....	310	2	2	" "
20*	A	160	.....	313	2+	1	" "
21*	B	.....	153	310	2	2	" "
22*	A	168	.....	304½	2+	1-	" "
23	B	168	.....	302	1-	1-	" "
24*	A	163	.....	306	2+	2-	Commercial
25*	A	123	.....	327	1	1	College Prep.

* This girl intends to go to college after she has taught a while.

followed by an almost mediocre showing at another, because of ill health or some unfavorable condition. Yet the total score would

TABLE II. CONTROL GROUP: MENTAL-TEST RATINGS, HIGH-SCHOOL MARKS AND TEACHERS' ESTIMATES OF INTELLIGENCE

(Girl's numbers are printed with an * following)

PUPIL'S NUMBER	SENIOR GRADE	ARMY ALPHA TEST	OTIS GROUP TEST	STAN- FORD GROUP TEST	AVERAGE OF HIGH- SCHOOL MARKS	TEACHERS' ESTIMATE OF INTEL- LIGENCE	COURSE
26	A	120	.....	252	2—	2—	College Prep.
27	A	116	.....	252	2—	2	" "
28	A	119	.....	248	3—	4	" "
29*	A	118	.....	247	2—	2	General
30*	A	119	.....	245	2+	3+	College Prep.
31	A	116	.....	246½	3+	3—	" "
32	A	109	.....	251	2	3+	" "
33	B	.....	108	248	3+	3	General
34*	A	119	.....	239½	3+	3	"
35*	A	118	.....	238	2—	2—	"
36*	B	116	.....	239½	2+	2—	College Prep.
37	A	120	.....	232	2—	2—	" "
38	B	.....	115	^a	3—	3—	General
39	A	117	.....	235	3+	3	College Prep.
40*	A	116	.....	235	3	3	General
41	B	.....	114	233½	3+	3	College Prep.
42	B	106	.....	243	3+	3	" "
43*	B	.....	114	232	3—	4+	General
44*	A	116	.....	220½	2+	2	Commercial
45	A	117	.....	218	3+	3	General
46*	A	115	.....	217	2—	3+	College Prep.
47*	A	117	.....	213	2—	2—	General
48	A	107	.....	221½	3+	3—	College Prep.
49	A	116	.....	201	3+	3—	General
50	B	.....	110	188	3+	3	"

^a This boy's total score cannot be given because, by mistake, he took two forms of the first part of the test instead of the two different parts. His performance, however, was average, and subsequent data justify his inclusion in the group.

be the same as if both performances were only moderately high. The principle involved was helpful in selecting some members of the group. Number 25 is a case in point. She hardly scored above the median in the first test, but was given the second because she was recommended by her teachers as being very bright. In a small group, with every effort made to remove feelings of stress and strain, she not only made a score exceeded by just eight in the city, but also proved herself a very fast worker. Number 7 is another one who probably deserves a higher place in the group. He had the second highest score in the first test, but did not rank so well in one part of the second. Before that test he had tried to be excused because of a headache. It should also be pointed out that ranking by total number of points gained gives greater weight to the longer test, which had the wide time limit. This may, or may not, be a desirable thing to do. Furthermore, the Otis test can be only roughly evaluated in terms of the Army test in the higher points of the scale. For example, it is practically impossible to make distinctions in the total performance of the first three or four subjects. For these reasons, then, we may be sure that a few points difference in score means nothing. It would be hard to differentiate between the first thirteen at least, on the basis of their tests.

The control group has also been ranked in order of total achievement in the tests. This arrangement must be accepted with the same caution as in the case of the superior group. Table II shows that the range for the Stanford test was from 188 to 252. Terman's median for pupils of the same grade was about 240.¹ Seventeen of our group, or 68 percent, had scores between 252 and 232, while seven others went lower than this. Nine were above 240. Speaking generally, the control group is quite homogeneous with respect to mental test ratings. All proved themselves able to pass at least the first test close to the median. It is immaterial that one or two fell well below the median in the second, because the intention was to have a group thoroughly distinct in calibre from the superior one.

Proportion of "high" and "low" seniors.—At the time of the tests fifteen of the superior group and eighteen of the control group were scheduled to go into the senior A ("low") grade the following semester, as is indicated in Tables I and II. As a matter

¹ From unpublished data.

of fact, five of these superior pupils, by carrying extra work, made the "high" grade, and two "high" seniors of the control group failed to graduate. This, however, does not concern us here. The point is that the distribution of upper and lower grade seniors is not sufficiently different to need consideration. That there were originally fewer "high" seniors than "low" seniors in both groups was doubtless due to the fact that the "high" senior class was smaller.

Sex differences.—It is apparent from Table I (in which girls' numbers are starred) that there are fifteen boys and ten girls in the superior group. It will also be noted that most of the latter (eight out of ten) appear in the second half of the list, which means that the girls' standing in the tests was, generally speaking, below that of the boys. Much the same sex differences were earlier discovered by the writer (5) in another group of twenty superiors and by Terman (3) in a younger and more highly selected group of eighty. Just what conclusion we may draw is not altogether clear. Is there here an indication of the inferiority of the female sex in "general intelligence"? Or is support lent to the theory of greater male variability, set forth by such men as Havelock Ellis (1) and Thorndike (4), and hotly contested by Mrs. Hollingworth (2)? Or is it that the tests are better adapted to masculine intellect, training, or temperament?

It is not the purpose of this study to discuss the matter at length. In the first place there are hardly sufficient data concerning groups of superiors. And in the second place the differences noted are not great. Certainly it must be admitted that mental tests are man-made, and some of them at least (the Army test, for example) are generally conceded to favor the male sex. As has been pointed out, the ranking of our group is rather uncertain, and difference of a few points means little. It may well indicate a difference in training—more housework, less experience with the world—or a disposition to become "flustered" under test conditions, a state of mind which may itself be partly due to training, or rather, the lack of it.

The control group has the same proportion of girls and boys as the other group simply because it was thought better to keep the number the same for comparative purposes.

High-school marks.—It is interesting to compare the high-school marks with the mental-test ratings (see Tables I and II). The school records were not entirely uniform, generally because of the pupil's transfer from another city; but it was possible from the data at hand to accord to each young person an average grade, which, it is believed, is a really trustworthy indication of his status. All marks received in high school except those for drawing, music, and physical training have been included in computing averages. The grades 1 (excellent), 2 (thoroughly satisfactory), 3 (passed and promotable), 4 (failed but with the possibility of "making up" the work), and 5 (complete failure) are used in the Oakland schools. Plus and minus signs have been added for finer discriminations.

Scrutiny of Tables I, II, and III shows that none of the superior group fell below 2—, and that ten, or 40 percent were 1² or 1—. On the other hand, none of the control group were as high as 1 or 1—, and fourteen, or 56 percent, were 3+ or lower. Furthermore, twenty-two superiors, i.e., nearly 90 percent elected the college preparatory course, which is considered more difficult than other courses; but of the other group only thirteen, or a little more than half, elected this harder course. The school records also showed that there were sixteen pupils of the control group who had failed in one or more subjects in high school. Number 38 had failed nine times. There was a single failure, due to absence through illness, among the superiors. The three in the control group rated 3— have left school without graduating.

There is also some agreement between total score in the tests and school standing. Superior pupils graded 1 and 1— appear mostly in the first half of the list. The same tendency is apparent in the control list in which the greater number of 2's, 2—'s, and 2+'s are in the upper part. There is no clear sex difference in the superior group, but the girls of the other group obviously surpass the boys in school work. Possibly, as has been suggested before, girls are at a disadvantage in mental tests. Or perhaps our findings merely give evidence of the well-known fact that girls generally gain better school marks than do boys. However, the number of cases in point is too small to warrant discussion.

* An average mark of 1 means that the marks obtained were very nearly all 1's.

Teachers' estimates of intelligence.—In obtaining teachers' estimates of intelligence, a five-point scale was again used. 1 was taken to mean "very superior to the average pupil of the same age"; 2, "superior to the average pupil" etc.; 3, "average"; 4, "inferior"; and 5, "very inferior." This scale, which is much used in Terman's work, has its limitations, for the five gradations are only defined in terms of degree. Nothing better, however, has yet been devised for a manifold comparison. The number of estimates for each pupil was generally three, sometimes as many as five or six. It was explained to the teachers that intelligence, not simply achievement in studies, was to be judged.

TABLE III. DISTRIBUTION OF HIGH-SCHOOL MARKS

AVERAGE OF HIGH-SCHOOL MARKS	SUPERIOR GROUP			CONTROL GROUP		
	Boys	Girls	Total	Boys	Girls	Total
1	1	2	3	0	0	0
1—	6	1	7	0	0	0
2+	2	5	7	0	3	3
2	2	1	3	1	0	1
2—	4	1	5	3	4	7
3+	0	0	0	9	1	10
3	0	0	0	0	1	1
3—	0	0	0	2	1	3

The estimates when averaged are seen (in Tables I and II) to be closely similar to the averages of school marks. Consequently, what was said in regard to the latter applies largely to the former. Tables III and IV make it clear that seventeen young people of the superior group were 2+ or above according to school marks, and sixteen were the same according to teachers' estimates. This means that 64 percent were considered decidedly superior in intelligence. Only one pupil had an average estimate below 2—, i.e., all were thought to be at least somewhat superior except this one boy, who was estimated a high average (3+). The reader is invited to consult the Appendix, for a description of this interesting lad (Number 13), whose teachers complained that he did not "conform" to school procedure. Again, none of the control group averaged above 2 by teachers' estimates, and

seventeen (nearly 70 percent) averaged 3+ or less, as against fourteen who were 3+ or less in school marks. The strong tendency of teachers to rate mentality by achievement in school work, was more than ever apparent in comparing an individual teacher's estimate of a pupil's intelligence with the school mark given by that teacher. Mark and estimate almost always coincided.

Summary.—With reference to the nature of the two groups the following points have been noted especially:

(1) With one exception the range of scores of the seventeen superior pupils selected by the Army test was from 156 to 191 (out of a possible 212 points). For the eight who took the Otis test, the range was 149 to 163 (out of 172). All twenty-five had the Stanford test, their ratings varying from 302 to 346 (out of 366).

TABLE IV. DISTRIBUTION OF TEACHERS' ESTIMATES OF INTELLIGENCE

AVERAGE OF TEACHERS' ESTI- MATES OF INTELLI- GENCE	SUPERIOR GROUP			CONTROL GROUP		
	Boys	Girls	Total	Boys	Girls	Total
1	2	4	6	0	0	0
1—	7	1	8	0	0	0
2+	2	0	2	0	0	0
2	2	4	6	1	2	3
2—	1	1	2	2	3	5
3+	1	0	1	1	2	3
3	0	0	0	6	2	8
3—	0	0	0	4	0	4
4+	0	0	0	0	1	1
4	0	0	0	1	0	1

(2) Twenty of the control group took the Army test, their scores lying between 106 and 120 (inclusive). The median for the city was 119. The five in the control group tested by the Otis test (median 116) made scores ranging from 108 to 115. In the Stanford test the ratings were from 188 to 252, most of them being above 232. A representative median for this school grade is 240.

(3) The distribution of "high" and "low" seniors in the two groups is not sufficiently different to need consideration.

(4) There are fifteen boys and ten girls in the superior group. The same proportion was kept in choosing the control group.

(5) A comparison of mental-test ratings with school marks and with teachers' estimates of intelligence shows fairly close agreement. Teachers' marks and estimates were very similar.

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CHAPTER IV

NATIVITY, HOME CONDITIONS, AND RELATIVES

Nativity.—All the pupils of both groups were born in the United States. It should be noted, however, that in selecting the control group three foreign-born pupils were rejected after the first test, on the ground that mental tests in an ill-understood tongue are no criterion of intelligence. All the pupils belong to the white race. Numbers 4, 24, and 48 are Jews. The nativity of parents is shown in Table V.

TABLE V. THE NATIVITY OF PARENTS

	FATHERS		MOTHERS		BOTH PARENTS	
	Number	Percent	Number	Percent	Number	Percent
SUPERIOR GROUP						
Native-born.....	18	72	18	72	16	64
Foreign-born.....	7	28	7	28	5	20
CONTROL GROUP						
Native-born.....	21	84	22	88	20	80
Foreign-born.....	4	16	3	12	2	8

The superior pupils are less "American" as to parentage than the duller group. This distinction is a good deal less pronounced in the third generation back, however. In the case of the superior group 48 percent of the grandparents were native-born; in the other case, 53 percent. In the writer's earlier study of twenty superiors (5) the situation was reversed, there being a somewhat larger proportion of native-born parents and grandparents for the brighter group than for the control group. In the present study there are seven cases (28 percent) in each group of three generations of native-born. The foreign countries represented are largely north European.

Occupations of fathers.—An attempt was made to classify the occupations of the fathers according to Taussig's scheme (2). In this, Group 1 consists of day-laborers, so-called, and other unskilled workers; Group 2 is made up of "those who while not needing specialized skill, yet bear some responsibility, and must have some alertness of mind . . . for example, motormen"; Group 3 includes the skilled workmen, "the aristocracy of the manual laboring class"; Group 4 comprises small tradesmen, clerks, foremen, etc.; and Group 5 is the professional class, "captains of industry," and the like. Table VI shows the distribution, according to this classification, of the occupations of the fathers.

TABLE VI. OCCUPATIONAL GROUPS OF FATHERS

OCCUPATIONAL GROUP	SUPERIOR GROUP	CONTROL GROUP
5	8	8
4	10	6
3	7	8
2	0	3
1	0	0

On the basis of Taussig's formula for rating social status by occupation of the father, our superior group ranks slightly higher. But the difference is certainly not great. Neither group is represented in the day-laborer class (Group 1), and none of the fathers of superior pupils is lower than the skilled-workman class (Group 3).

Home conditions.—Merely to know the occupation of the father does not, however, give one an adequate conception of home conditions.¹ Hence, the Whittier scale for grading home conditions (3) was used, this being probably the most comprehensive and successful standard for the purpose. Its originator, Dr. J. Harold Williams, says in part: "Data with reference to each of five items, (I) necessities, (II) neatness, (III) size, (IV) parental conditions, and (V) parental supervision . . . being recorded in the record blank . . . each item is then accorded a

¹ In fact, a number of the fathers were dead or divorced, as will be shown later.

grade upon a scale of five points, following the classified items shown on the standard score sheet. . . . The sum of the grades of the individual items gives the total score, or 'Home Index,' which is the final value used for comparative purposes." (4) Under the head of "necessities" the field-worker is to record information relating to ordinary economic needs (probable income, food and clothing, shelter, furnishings, and comforts) as judged by inspection of the home and conversation with members of the family. "Neatness" includes order and cleanliness within and without the dwelling. "Size" is, of course, in proportion to the number of persons living in the home. "Parental conditions" are discussed with regard to intelligence and harmony of parents or guardians, and as to whether they are separated, divorced, dead, or much absent from the home because of employment. Lastly, "'parental supervision' refers to the manner in which parents exercise their authority and with what result; the extent of this supervision, and how much interest is behind it." (3)

In illustration of the general method, what Doctor Williams says in reference to "necessities" may be quoted: "In grading this item on a scale of five points, 1 is used to indicate very inferior equipment, i.e., less than could be considered really necessary to a decent existence. Grade 0 represents a condition of extreme poverty. Grade 3 indicates that there may be no hardship, but no more than necessities were found. Grades 4 and 5 (in a few cases Grade 6 is used) indicate a superior condition of necessities, i.e., more (or of a better quality) than can be considered essential." (4) The varying degrees for each item are represented on the Standard Score Sheet.

When the homes of our fifty subjects were graded in accordance with this plan the total scores, or "Home Indices," were found to be as in Table VII. The range is from 18 to 26 in both groups; the median is 24 for both; and the averages are almost identical, viz., 22.96 for the superiors and 23.40 for the other group. In the writer's earlier study the range for twenty superiors was found to be from 19 to 26, with the median at 23; no figures were obtained for a control group. These findings are in sharp contrast to those given in Doctor William's study (4) of 120 homes of delinquent boys. He found a range of 5 to 25, with a median of 15. He also tells of another investigation of "fifty

homes taken from the non-delinquent population . . . largely homes of business men, laborers, tradesmen, and college professors." Of these homes he says, "While not selected with sufficient exactness to represent an average for the general population, the results are of sufficient consequence to mention." His figures for these fifty homes show home indices ranging from 4 to 26, with a median at 22. These comparisons demonstrate the thorough adequacy of the homes of both our superior and control groups. All high-school seniors belong, of course, to a highly selected group for the population in general.

TABLE VII. DISTRIBUTION OF HOME INDICES

HOME INDEX	NUMBER OF CASES IN SU- PERIOR GROUP	NUMBER OF CASES IN CON- TROL GROUP
26	3	1
25	5	7
24	5	6
23	1	4
22	6	4
21	0	2
20	2	0
19	2	0
18	1	1

Details concerning the home conditions of both groups of pupils may be gathered from Table VIII on the opposite page. For both groups the medians fall at 5 for every item except "parental supervision," where it falls at 4. The differences between the groups are seen to be small. With respect to "necessities" and "size," where one would naturally expect to find correlation, the advantage is with the control group. In fact, three pupils of this group came from the wealthiest homes visited, one of them being that of a junk dealer! The last item, "parental supervision," is a little higher for the superior group. It would be higher still (and "parental conditions" along with it), but for the greater proportion of "broken" homes among the superiors. In the control group there are only four broken homes (16 percent), all due to the death of one parent (three fathers and one mother);

but in the superior group there are twice as many broken homes, four due to the death of one parent (three fathers, one mother), one to the death of both parents,² and three because the mother divorced the father.³ The parents in still another home were

TABLE VIII. RATING OF HOMES IN DETAIL

ITEMS	NUMBER OF HOMES RECEIVING THE INDICATED NUMBER OF ITEM POINTS ^a					
	1	2	3	4	5	6
NECESSITIES						
Superior group	0	0	4	7	<i>13</i>	1
Control group	0	0	0	9	<i>13</i>	3
NEATNESS						
Superior group	0	0	0	2	<i>23</i>	0
Control group	0	0	0	3	<i>22</i>	0
SIZE						
Superior group	0	0	5	3	<i>16</i>	1
Control group	0	0	0	7	<i>15</i>	3
PARENTAL CONDITIONS						
Superior group	0	0	4	3	<i>18</i>	0
Control group	0	0	1	7	<i>17</i>	0
PARENTAL SUPERVISION						
Superior group	0	0	1	12	10	2
Control group	0	0	3	12	10	0

^a Figures in italics show where medians fall.

separated for several years at an earlier period. The greater number of broken homes in the case of the superiors accounts in part for the fact that the mothers in this group have had considerably more paid employment than those of the other group. Eighteen (72 percent) of the former, as against nine (36 percent) of the latter, have been employed outside the home, either before or after marriage. At present, however, there are only six among the

² The child in question is the son of a college professor. His foster-mother has carefully preserved written records of his early history and of his parents, both of whom died in her home.

³ One father "drank"; another "ran around with other women." The cause of the third divorce is unknown. Information of such an intimate nature was never solicited.

mothers in the superior group,⁴ and two among the others,⁵ who are employed.

In some respects, certainly, life has been less easy for the superior pupils as a group; and their parents have been more often absent from the home. Their mothers have sometimes shown remarkable intelligence and grit. For example, one divorced woman, who remarried when her children were one and three years of age, respectively, has for years done all her housework, cared for the children, and yet earned enough for their support, because she "never wished it thrown in their faces that they were supported by a step-father." It is in such qualities as atmosphere of work and love of independence—qualities not readily expressed in terms of a scale—that the homes of the superior young people seem to excel.

Education of parents.—The question of the amount of formal education of parents is necessarily involved in an adequate discussion of home conditions. Table IX will show how many parents completed, or nearly completed, a specified type of schooling.

TABLE IX. EDUCATION OF PARENTS

TYPE OF EDUCATION	GROUP	FATHERS	MOTHERS	TOTAL	BOTH PARENTS
POST GRADUATE	Superior	1	0	1	0
	Control	1	0	1	0
COLLEGE	Superior	6	2	8	2
	Control	4	2	6	0
NORMAL SCHOOL	Superior	1	2	3	1
	Control	0	3	3	0
HIGH SCHOOL	Superior	3	7	10	1
	Control	5	7	12	1
GRAMMAR SCHOOL AND BUSINESS COLLEGE	Superior	6	2	8	1
	Control	2	1	3	0
GRAMMAR SCHOOL	Superior	8	12	20	8
	Control	13	12	25	8

The most striking thing apparent from Table IX is the small amount of difference between the two groups. If we draw a line

⁴ Two saleswomen, one nurse, one charity worker, one dressmaker, and one upholstress.

⁵ Two saleswomen.

between "high school" and "grammar school and business college" in the table, we find precisely the same totals for each group above and below the line, i.e., twenty-two (44 percent) in each had at least a high-school education. Some slight differences, however, show superiority in training for the superior group. There are two more fathers in this group who have gone to college, although there are two less with only a high-school education. Again, eight parents of the superior group are in the "grammar-school-and-business-college" classification, but only three of the control group belong here. There are three cases among the former of both parents having a college or normal-school education, but none among the latter.

That the parents of the brighter pupils are, generally speaking, superior intellectually to the other group of parents is hardly evident on a basis of educational accomplishment. In the absence of scientific knowledge the writer can only say, as a matter of opinion, that the "superior" parents actually do seem somewhat superior in intelligence. Three "superior" mothers taught in the grades before marriage, and another, a former high-school teacher, has long been very prominent in civic work. There are only two in the other group who have been teachers (one a grade teacher and the other a kindergartener), and certainly no woman of civic prominence. But to discuss all the occupations of the mothers would take us too far afield. "Interesting" and "unusual" are adjectives one could scarcely refrain from applying to many of the "superior" mothers and their varied employments. The writer has not the same impression of the other group. As regards the occupational status of the fathers, it has already been noted that, by Taussig's scale, the superior group ranks slightly higher.

Brothers and sisters.—It is sometimes contended that "only" children are given greater attention than others, and that hence their ability is better developed. Since there are five "only" children in *both* of our groups, no advantage for either can be argued on this ground. On the other hand, four of the mothers (three in the superior group, one the control) have long been widows dependent on themselves for support, and so have been less able to give time to their children. When there was more than one child in the family the mother was asked whether or not she considered the boy or girl in question brighter than her other

children. Eight mothers found little difference in degree of intelligence, though they often added qualifying statements about other members of the family such as, "just as bright but not so studious," "as bright but in a different way." Twelve mothers thought at least one other of their children less intelligent. There are no data by which to verify their statements.

Heredity.—Many questions were asked concerning the intelligence of other relatives besides those in the immediate family. The parents seemed entirely willing to give such information, but were often not well-informed themselves in the matter, for the "family tree" and "ancestors" are deemed unimportant in this region of the country. The answers obtained are not complete enough for statistical treatment. However, from the data secured the writer has attempted to rate the family connection in general intelligence, as very superior, superior, average, inferior, or very inferior, to the population at large. It is obvious that this can be only a very rough estimate, merely offered in lieu of nothing better. Conclusions were based especially on occupation, education, achievements, and prominence in the community. Were there any noteworthy relatives? What, if any, occupations or professions were especially characteristic of both sides of the family? Did any relatives have any special talents or achieve any particular successes? These were some of the questions asked. It was easy to gauge the general accuracy of parents' accounts from details given. According to the writer's estimates eighteen, or nearly three-fourths, of the superior group and twelve, or nearly one-half, of the control group have a family connection superior in intelligence to the general population, i.e., the usual type of mind is above that of a skilled workman or his kind.⁶ All the rest are probably average. Just how many of those rated superior might better be considered very superior is a more difficult question—possibly four (16 percent) in the superior group and one or two in the control group. Fewer eminent relatives were mentioned for the latter. It is quite unlikely that the heredity of either group is very remarkable, i.e., of such an order as Galton discusses in *Hereditary Genius* (1).

⁶ Note that Taussig places skilled workmen in the middle occupational group. See pp. 134-138, Vol. 2, in Taussig's *Principles of Economics*, New York, 1915.

Summary.—The information concerning nativity, home conditions, and relatives may be summarized as follows:

- (1) All the pupils of both groups are native-born whites.
- (2) Seventy-two percent of the parents of the superiors are native-born, and 86 percent of the parents of the other young people. For both groups approximately half the grandparents were native-born, there being a slightly greater number of foreign-born "superior" grandparents.
- (3) According to Taussig's formula for rating social status by occupation of the father, the superior group ranks a little higher.
- (4) Using the Whittier scale for grading home conditions we find practically no difference in central tendency between the two groups, considering the home environment in its total aspect. Both groups of homes doubtless rank high for the general population. Taken collectively, the homes of the control group excel the others somewhat in material possessions; but in the homes of the superiors parental supervision is slightly better. In fact, it would be rated still higher if there were not twice as many broken homes among the superiors as in the other group. From interviews with the parents (chiefly mothers) and from occupational data the writer has gained an impression that the "superior" parents are rather superior intellectually to the others. On the whole, the education of the former has been only a trifle better than that of the latter.
- (5) Five young people in each group are "only" children.
- (6) From rather incomplete data the writer estimates that nearly three-fourths of the superior pupils and nearly one-half the other group have a superior heredity, i.e., the family connection is probably superior in intelligence to the general population. It might be considered very superior in perhaps four cases of the superior group and in one or two of the other. There are no cases of a mentally inferior stock.

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CHAPTER V

HEALTH AND PHYSICAL DEVELOPMENT

Health during infancy.—The mothers were asked whether the child's health during infancy (which was defined as the first two years) was very good (1), good (2), fair (3), poor (4), or very poor (5). Nineteen, or 76 percent, of each group of children were reported to have been in very good (1) health in babyhood. In fact, only one among our fifty cases, a boy in the control group, had been very sickly. This excellent record may be in great measure due to the large proportion of children native to the western coast, where climatic conditions are particularly favorable to infants and nursing mothers. Sixteen (64 percent) of the superior group and twenty (80 percent) of the other had been breast-fed full time, that is, at least nine months; and only six (two of the superiors and four of the control group) has been entirely bottle-fed.

First teeth.—An answer to the question, "When did the first teeth appear?" was sometimes given hesitatingly, for there were written records for only three of the superior children and seven of the others. With respect to the time of the appearance of the first lower incisors the two groups compare as indicated in Table X.

TABLE X. AGES AT WHICH LOWER INCISORS APPEARED

	RANGE (months)	MEDIAN (months)	AVERAGE (months)
SUPERIOR GROUP.	3-11	6	6.7
CONTROL GROUP..	4-14	7.5	8.1

On the independent testimony of the mothers, then, the brighter group was more precocious. Emmett Holt (3) gives the normal time for the first teeth as from four to nine months. One

of the superiors had teeth as early as three months, but no child of the control group was ahead of normal. Five superior children did not cut any teeth until ten or eleven months of age, and seven of the control group were somewhat retarded, one infant until his fifteenth month.

Age of beginning to walk.—Whether or not normal children walk and talk earlier than feeble-minded children is a question that Mead's statistical study (5) answers in the affirmative. The writer's data lend color to the theory that children of superior intelligence develop these functions earliest of all. The parents were asked to tell the age, nearest month, at which the child was able to walk unassisted. "To walk" means to walk at least a few steps and is to be considered as the first stage in a process that is developed without undue interruption. Mead's definition of walking, viz., "to take a step unassisted" might permit the inclusion of cases where the function in question has not actually begun to be established. In the comparison given in Table XI, it should be remembered, therefore, that the writer's figures represent a conservative estimate.

TABLE XI. AGES AT WHICH CHILDREN LEARNED TO WALK

	RANGE (months)	MEDIAN (months)	AVERAGE (months)
MEAD: 144 "schoolable" children of the higher grades in the Indiana School for Feeble-Minded Youth.....	12-72	21.60	24
MEAD: 50 normal children ^a	11-30	13.54	14
THIS STUDY: control group.....	10-22	13	13.7
THIS STUDY: superior group....	10-15	12	12.3
EARLIER STUDY BY THE WRITER: 20 superiors.....	9-19	12	12.2

^a Since Mead's normal group was comprised of children of graduate students at Columbia and a few professors, it was probably rather above average in intelligence. It will be noted that the control group is a little more precocious than Mead's normal group, probably because of the less favorable climate of the East.

"Infant Care" (7), a publication of the United States Children's Bureau, gives the normal age for beginning to walk alone

as twelve or thirteen months. These various comparisons certainly point to the greater precocity of bright children. In the present study of superiors there are only five cases of beginning walking later than thirteen months, but seventeen earlier.

Age of beginning to talk.—An investigation of the age when children first talk is beset with difficulties. Many mothers have in mind the first word; some the first few words. The writer knows a mother who declares her baby said, "Mamma," at four months. A chance word, or something that sounds like a word, is often set down in the "baby-book" as the beginning of talking. Hence there is an objection to Mead's definition of talking as *using a word intelligently: i.e., associating the idea with the object*. In the hope of getting a more definite estimate the mothers were asked to state when the child could first use words in short sentences.

"At the end of the second year the average child is able to put words together in short sentences," says Emmett Holt in *The Care and Feeding of Children* (3). It is this stage that is meant. The mothers often found difficulty in giving exact ages, but the judgments offered were thought to be fairly accurate.¹ In computing measures of central tendency it has been thought best to ignore the datum for Number 13, because this boy was put in charge of a German nursery-governess at about the time when he would normally have been expected to begin using his native language. The result was that German was the first language he could really speak (at three years of age). The remaining twenty-four cases compare with the control group as shown in Table XII. Since twenty-four months is the usual average estimated by authorities (7) on early childhood, the superior group was unquestionably accelerated in speech development.

Health since infancy.—Ratings on health since infancy were based on the mother's report of all the illnesses and physical weak-

¹ It is extremely unlikely, however, that Numbers 38 and 50, two of the dullest in the control group, talked as early as their mothers stated (12 and 18 months, respectively). These two mothers made a good many assertions that were found to be erroneous. See next chapter. Some of the testimony of the mother of Number 31, who is said to have talked at 16 months, also proved rather unreliable. However, the figures given by these mothers have been used in finding the average, etc. for the control group.

nesses of the child and her estimate of general health. As in the case of health in babyhood, 1 was taken to mean very good; 2,

TABLE XII. AGES AT WHICH CHILDREN BEGAN TO TALK (USE WORDS IN SENTENCES)

	RANGE (Months)	MEDIAN (Months)	AVERAGE (Months)
SUPERIOR GROUP.....	12-30	18	19
CONTROL GROUP.....	12 ^a -36	24	25

* See footnote to page 28.

good; 3, fair; 4, poor; and 5, very poor. Table XIII gives the distribution.

The two groups had about the same records for health in infancy, but here the control group has the better one. Twenty-three, or 92 percent, of this group and nineteen, or 76 percent, of the brighter pupils are rated at least 2 (good). One reason for this difference may be that the mothers of the superior children were more often employed outside the home and so less able to look after their children and to provide them with physical comforts. Terman's work (6) tends to show that children of

TABLE XIII. HEALTH SINCE INFANCY

HEATH RATING	SUPERIOR GROUP	CONTROL GROUP
1	13	15
2	6	8
3	4	0
4	2	2
5	0	0

exceptional intelligence are not below the average in general health, as so many people believe, and his conclusion is that reached by the writer in a previous study (9). Certainly a proportion of 76 percent of the present superior group who have a health record of "good" or "very good" (for the most part "very good") does not imply sickness among superiors. The same number—two—in each group are rated 4 (poor). The two in

the superior group, however, are now in excellent health. One mother said of her son (Number 6), "He has had terrible illnesses but he is always very well between times." On the other hand, the two in the control group have been persistently delicate—or positively ill—since early childhood.

All fifty subjects have had measles, and all but three of the superiors and one of the control group had one or more of the other contagious diseases or other ailments. Eleven in the superior group and nine in the other had adenoids removed; eleven in each group had their tonsils taken out; and ten of the superiors and nine of the other children had both tonsils and adenoids removed. One child in each group (Numbers 21 and 38) has suffered from almost total deafness in one ear. Two bright children and one dull one stuttered in childhood but have practically overcome this difficulty since. There are four superior pupils and five in the other group, who wear glasses. Numbers 1 and 2 among the superiors have had chorea, one case being an after-effect of inflammatory rheumatism. Four others in this group and five in the other were described as "somewhat high-strung" or "apt to worry over lessons," but none of these has had any genuinely neurotic symptoms. However, Numbers 35 and 39 in the control group (the two who are rated 4 in health) have been seriously troubled with nervousness and what might appropriately be called a pathological dread of recitations, supposedly unsympathetic teachers, and the like.

As regards height, weight, and general evidences of health at present, the superior young people seem to have some advantage over the others, though figures on these points are not sufficiently exact to give precise data. Woodrow says that "exceptionally bright children average somewhat above normal children in height and weight" (8).

Age at maturity.—Authorities differ somewhat on the question of the usual age of puberty. It is most frequently given as from thirteen to fifteen for girls and from fourteen to sixteen for boys, in the temperate zone, more particularly in this country. Though our figures are too few to warrant definite conclusions, the facts in the cases should be noted. The ages (nearest birthday) at the first menstrual period of the ten girls in each group ranged from 11½ to 15 years for the brighter girls, and from 12 to 17

years for the others. The average in the former case was found to be 13.4 years; in the latter 14.3 years. Three of the control group were over fifteen. The girl in the superior group who matured at eleven and a half is a Jewess, and it is well-known that Jews mature early. Even if we disregard this instance, a tendency to earlier physiological maturity among the superior girls is apparent.

Judgments of the boys' ages at puberty were based chiefly on the time the voice changed, though the mothers were also asked when they first noticed a marked increase in height and when hair first appeared on the face. Since these changes were so recent—unlike first dentition, walking, and talking—we may doubtless accept the mothers' testimony as pretty reliable. The range for the superior boys was from 13 to 16 years and for the others from 13½ to 17 years. The average for the former was 14 years and for the latter 15 years. That is, the superior group is one year ahead of the control group. If we accept fourteen to sixteen as the usual age of puberty, four of the bright boys may be considered precocious because they were about thirteen when they reached physiological maturity; only two in the control group were under fourteen. None of the superior boys were over sixteen, though four of the others were beyond that age. Race does not seem to have been a very important factor. There is one Jew in each group (Numbers 4 and 48, who matured at 14 and 13½, respectively). The fact that Number 10 of the superior group is the son of Italians, who also mature early, may account for his reaching puberty at thirteen years of age.

Boas (1) and Irving King (4) have shown that good environment hastens the pubertal change and that children of the laboring classes develop later than those more favorably situated. These conclusions do not, however, explain the difference between our two groups, for it will be remembered that home conditions were propitious for both. The duller group was even found to have a rather better health record. A peculiarly favorable environment cannot, then, be the cause of the earlier maturing of the superiors. If our subjects were pre-pubescents we might look for an explanation of the difference in brightness in the fact that physiological and mental development keep pace. The investigations of Crampton (2) and Woodrow (8) prove that the rapidity with which a

child completes his mental growth is correlated with the rapidity of his anatomical development. In other words, a bright child may be bright simply because he is anatomically, and hence mentally, older. But the young people we are considering have all matured, so the physiological differences cannot be great. It will be shown later that chronologically our superior group is at least a year younger than the control group, and we have just seen that the former reached physiological maturity sooner. It is not unlikely, therefore, that the two groups are now much the same age anatomically, that is, they have both come to a similar stage of anatomical development. *Nevertheless, one group is much brighter than the other.* The same thing was found in the writer's earlier study. Further data would probably prove conclusively that bright boys and girls tend to arrive at puberty sooner than dull ones.

Summary.—With regard to health and physical development the following facts are the most salient:

(1) On the whole, the control group has excelled the superior in general health, but the difference is not marked. It is quite unlikely that the superior group should be considered below average in health.

(2) According to the mothers, the superior children, as a group, cut their first teeth earlier. There is a difference of about a month and a half in central tendency.

(3) There is a similar difference in favor of the brighter children in the age of learning to walk. Their precocity shows even more clearly when comparisons are made with norms of other investigators.

(4) The more intelligent group could put words together in sentences sooner than the others could. For the brighter group as a whole there was an acceleration of six months in speech development, not only in comparison with the control group but also with the performance of the average child, as estimated by authorities on early childhood.

(5) The brighter boys and girls reached physiological maturity earlier than the others.

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CHAPTER VI

EDUCATION AND MENTAL DEVELOPMENT

Mental superiority may be discussed under two heads, precocity and unusual ability, though it is often difficult to separate the two. This chapter will present some pertinent data secured.

Very early evidences of precocity and unusual ability.—Besides the precocity in speech development already noted, which might appropriately be discussed under mental development, there are other evidences of very early mental alertness in the superior group. The mothers of the children in this group spontaneously made use of such expressions as "asked the whys and the wherefores of everything," "never forgot what you told him," "very observant," "mentally like a child much older, every one said." At three years of age one child could say about forty Mother Goose rhymes; at two and a half another could recite all of Mother Goose; a third knew all the street cars at three, though no one knows how he learnt them; a fourth could subtract simple numbers before he was four; a fifth spoke, read, and wrote English and German at five; a sixth overwhelmed her parents with remarkable questions about God; and so on and so on. It is quite different with the control group, however. Only one mother believed she could give evidence of precocity, and this turned out to be "he kept himself very clean and neat," "at eight months he fed himself with a fork," "he learnt to thank people when real small."¹ The difference between the two groups showed markedly in the quantity and quality of questions asked, according to the mothers' testimony. Twenty-one, or 84 percent, of the superior children were reported to have asked decidedly more questions than the average child and their questions were also rated as unusually intelligent. Moreover, there was not infrequently noted an ability on the child's part to offer well-reasoned explanations of matters attracting his attention. On the other hand only

¹ Number 38. See footnote to p. 28 for a comment on the unreliability of his mother's testimony.

seven, or 28 percent, of the control group were said to have asked an unusual number of questions, and in one case the mother said, "J. asked a great many questions but I am afraid they were not always very sensible ones."

Kindergarten attendance.—Ten of the superior group and five of the control group attended kindergarten. There is no particular significance in these figures, for six of the ten superior children and one of the five "control" children were sent to kindergarten because their mothers were either employed or had heavy household duties. This leaves four in each group sent through no special necessity. Four of the superior group attended for six months or less, four for one year, one for a year and a half, and one a private kindergarten for three years (Number 15). Three of the control group attended four months or less; one, one year; and one, two years.

Formal home instruction and age and grade at entering school.—In only five cases in the superior group and two in the control had there been any serious attempt at formal home instruction. It should be noted that none of the superiors were regarded as prodigies or reared as such. Number 2 was taught in his fifth year by his mother, who found him a very apt pupil. He entered the second grade at six though he was practically ready for the third. Number 13, when between two and five years of age, had a German nursery-governess who took delight in teaching her clever charge to read and write English and German and to add and subtract. At seven years he entered the high third grade. Number 14 was so eager to learn that her mother was pressed into teaching her to read. Number 20 was taught the regular school subjects by her mother, and entered the high fourth grade at eight. The child read remarkably well before she was six. Number 23 showed such a keen interest in books that his mother taught him in his fourth year. When nearly five he entered school, ready for the second grade at least, but only permitted in the first. Such eagerness for knowledge was not apparent in the control group. Number 29 was taught rather irregularly for three years by her half-sister, a normal-school student who wished practice, and the child was able to enter the second grade at the age of eight. Number 44 was taught "to read and figure" by an ambitious grandmother,

but this did not advance her in school for she entered the first grade when six and remained in it the full time.

All of the superior children entered the grades at six or seven years except three. One entered at five, and two others at eight, one of these having had home instruction and the other having attended a private kindergarten. Nineteen of the control group began their school attendance when six or seven years of age. Of the remaining six—who entered about eight—five had been allowed to stay out of school for no very good reasons and one had been taught at home. The last was the only one of the control group who began school in a grade above the first, but five superiors entered higher grades at once.

*Age of learning to read.*²—Besides the children who had definite home instruction there were others who had learned to read previous to entering school. These, as one might suppose, were all in the superior group. Number 9 learnt to read, without being taught, at five years of age and soon after to write. Number 3 could read before he was six, possibly learning from an older brother. Numbers 11 and 17 astonished their mothers by their ability to read fluently after one day in school, though they had had no previous instruction except such as came through asking questions. Fortunately they were both promptly transferred to the second grade. Eight other superiors “just picked up their letters” and “learnt to spell some words,” through insistent questioning or from older brothers and sisters. Several children were very anxious to learn to read but were put off for various reasons.³ With superior children learning seems to be markedly self-initiated and often self-conducted. A previous investigation (2) and Terman’s study (1) of an even brighter group indicate more clearly the conclusion here reached, viz., that the superior child early evinces precocity and spontaneity in the learning process. It is noteworthy that there were only three children in the control group who learnt even the alphabet without being deliberately

² In this discussion “to read” means ability to read text at least as difficult as any primer, and generally of first-reader quality.

³ One reason sometimes given was that “teachers don’t want the children taught at home.” The objection is that home and school methods conflict and, if learning to read is begun, but not completed, in the home much confusion and loss of interest result.

taught. These children (Numbers 32, 35, and 42), who entered school at seven, eight, and seven years of age respectively, had succeeded in "picking up" their letters from older children in the family, but this was the extent of their pre-school achievement.

TABLE XIV. AGES AT LEARNING TO READ

	NUMBER IN SUPERIOR GROUP	NUMBER IN CONTROL GROUP
From 4th to 5th birthday.....	1	0
From 5th to 6th birthday.....	5	0
From 6th to 7th birthday.....	15	13
From 7th to 8th birthday.....	3	7
From 8th to 9th birthday.....	1	4
From 9th to 10th birthday.....	0	1

A complete tabulation of the ages at which these children learned to read is given in Table XIV. From this table the precocity of the superior group is apparent. For example, six, or 24 percent, in the superior group, but no one in the other, could read before the sixth year.

Attendance at private schools.—None of the superior group ever attended private school except the one child who went to a private kindergarten. Of the control group three have gone to private schools part of the time. One spoilt child (Number 28) sandwiched his public school course with attendance at three different private schools, because, to quote his mother, "he wanted a change" or "was not particularly interested." It is perhaps needless to say that each school he left was enthusiastic about his departure. The other two children of the control group (Numbers 26 and 36) attended private schools for several years chiefly because their parents were people of means and social position.

Rapidity of school progress.—We can disregard private school attendance in considering rapidity of progress through the grades because there was practically no difference between the private and public institutions in grade arrangement. Table XV shows that eighteen, or 72 percent, of the superior children have skipped from one to five half-year grades. The average for the whole

TABLE XV. SUPERIOR GROUP: EDUCATIONAL DATA

(Girls' numbers are followed by an *)

PUPIL'S NUMBER	REGULAR IN SCHOOL ATTENDANCE?	HALF- YEAR GRADES SKIPPED, INCLUDING HIGH SCHOOL	HALF- YEAR GRADES REPEATED, INCLUDING HIGH SCHOOL	YEARS RE- QUIRED TO COM- PLETE HIGH SCHOOL	AGE AT GRADUA- TION FROM HIGH SCHOOL Yrs. Mos.	
1	No (illness)	0	0	4	19	1
2	Yes, but out nearly $\frac{1}{2}$ year (illness)*	1	0	4	16	7
3	Yes, but out $\frac{1}{2}$ year (moving)	0	0	4	18	5
4	Yes	2	0	3	17	0
5	Yes	2	0	4	17	4
6	Yes, but out $\frac{1}{2}$ year (illness)	0	0	4	18	5
7	Yes	3	0	3 $\frac{1}{2}$	16	2
8*	Yes	2	0	3 $\frac{1}{2}$	17	0
9*	Yes	4	0	3	16	10
10	Yes, but out $\frac{1}{2}$ year (illness)	2	0	3	17	4
11	Yes, but out $\frac{1}{2}$ year (moving)	4	0	3 $\frac{1}{2}$	17	10
12	Yes	1	0	4	17	7
13	Yes	0	0	4	16	5
14*	Yes, but out $\frac{1}{2}$ year (mother's illness)	3	0	4	17	6
15*	Fairly	2	0	4	18	10
16*	Yes, but out 1 $\frac{1}{2}$ years (needed at home)	1	0	3 $\frac{1}{2}$	18	11
17	Yes	5	0	4	16	4
18	Yes	4	0	3	16	7
19	Yes, but out 1 year (at work)	0	0	4	19	5
20*	Yes	1	0	3 $\frac{1}{2}$	15	10
21*	No (illness)	1	0	3 $\frac{1}{2}$	18	9
22*	Yes, but out $\frac{1}{2}$ year (moving)	3	0	3	16	8
23	Yes	3 ^b	0	4 $\frac{1}{2}$ ^c	17	2
24*	Yes	0	0	4	18	7
25*	Yes	0	0	4	18	0

* Though not coached, he did not repeat the grade missed.

^b The effect of his three extra promotions was nullified by frequent change of school.^c See p. 40.

TABLE XVI. CONTROL GROUP: EDUCATIONAL DATA

*(Girls' numbers are followed by an *)*

PUPIL'S NUMBER	REGULAR IN SCHOOL ATTENDANCE?	HALF- YEAR GRADES SKIPPED, INCLUDING HIGH SCHOOL	HALF- YEAR GRADES REPEATED, INCLUDING HIGH SCHOOL	YEARS RE- QUIRED TO COM- plete HIGH SCHOOL	AGE AT GRADUA- TION FROM HIGH SCHOOL	
					Yrs.	Mos.
26	Yes	2	2	5	17	7
27	Yes	3 ^b	0	4	16	9
28	Fairly	0	2	5	19	10 ^d
29*	Yes	0	0	4	19	4
30*	Yes	0	0	4	17	6
31	Yes, but out 1 year (moving)	0	0	4	19	9
32	Yes	3	1	4½	18	1
33	Yes	1	0	4	18	4
34*	Yes	1	1	3½	18	5
35*	Yes	0	0	4	19	11
36*	Yes	1	0	3½	17	7
37	Yes, but out ½ year (illness)	1	2	4½	19	4
38	Fairly	0	3	5	19	1 ^d
39	Yes, but out nearly ½ year (illness) ^a	1	0	3½ ^b	18	1
40*	Yes, but out nearly ½ year (mother's illness)	1 ^c	0	4	19	5
41	Yes, but out ½ year (illness)	0	0	4	20	1
42	No (moving)	1	2	4½	18	1
43*	Fairly, but out 1 year	1	0	4	20	2 ^d
44*	Yes, but out ½ year (moving)	1	0	4	18	1
45	Fairly	1	0	4	19	7
46*	Yes	0	2	4	19	6
47*	Yes	0	0	4	18	10
48	Yes	0	2	4	20	0
49	Yes, but out 1 year (at work)	0	0	4	19	3
50*	Yes	1	0	4	17	11

^a Had private coaching to make up the work so was not obliged to repeat.^b See p. 41.^c Also saved a half year through transfer to a country school.^d See p. 42.

group is 1.76 grades skipped. No one has ever repeated a grade.⁴ Of the control group fourteen, or 56 percent, have skipped from one to three grades (see Table XVI), and the average for the group is .76. Nine, or 36 percent, have repeated from one to three grades. These figures include high-school grades, i.e., if a boy has completed high school in three and a half years he is reckoned as skipping one high-school grade. Grades omitted through immediate entrance into a grade higher than the first are, of course, excluded.

Progress in high school.—(See Tables XV and XVI.) One is perhaps surprised to learn that slightly over half the control group have skipped grades, but this does not seem so surprising when it is noted that almost all the grades skipped were elementary ones. Table XVII contrasts the two groups as to rate of advancement in high school, where the control group has done less difficult work but has progressed much more slowly.

TABLE XVII. RATE OF ADVANCEMENT IN HIGH SCHOOL

YEARS REQUIRED TO FINISH HIGH SCHOOL	SUPERIOR GROUP	CONTROL GROUP
3	5	0
3½	6	3
4	13	16
4½	1	3
5	0	3

The one superior boy (Number 23) who has taken over four years to complete his studies entered high school when he was under thirteen, but had to prolong his course because he largely supported himself. Those in the control group who spent four and a half or five years in high school have no satisfactory excuse to offer.

Some reasons for additional promotion.—Some of the reasons why children in the control group were advanced in school are amusing. For example, two months after entrance one first-grader (Number 42) told his teacher that he had been to school

⁴ Note reference to Number 23 in the next section.

before, so he was transferred to the high first grade; sometime later he explained that he had meant Sunday school! Number 27 was once advanced because he proved troublesome to a certain teacher. Number 39, who completed high school in three and a half years, was pushed and prodded by his mother in order to keep up with his much brighter twin, though on more than one occasion his teachers promoted him very reluctantly.

Attitude of parents towards rapid advancement.—The opposite tendency is observable with the four mothers of superior children who purposely restrained them from the more rapid progress suggested by their teachers. Ill health was not the deterring motive. In three cases (Numbers 5, 22, and 25) the reason given was that too precocious mental development was believed harmful and should be discouraged. One child (Number 6) was held back out of consideration for a dull older brother. Most of the children in the two groups, however, were allowed "to go their own pace," as Terman puts it. (1) According to the testimony of the mothers, only five in the superior group and six in the control (excluding Number 39 mentioned in the last paragraph) received parental encouragement—and this of a mild sort—to go ahead rapidly.

Regularity in school attendance and change of school.—Celerity in completing the school course is partly contingent on regular attendance. It will be seen from Table XV that thirteen of the superior children were rated by their parents as "regular" in attending. Nine were regular except for some period of a half year or more when kept out by their own illness (three cases), or the mother's (two cases), because at work (one case), or because the family moved to another city (three cases). One child was reported only fairly regular. Two others, Numbers 1 and 21, were decidedly irregular on account of illness. Number 21 skipped one grade nevertheless. Number 1, while set down as skipping no grades, really made remarkable progress, for he was three times promoted on the strength of only a few weeks' attendance and never failed of promotion though he has lived in six different cities during his school course. Moving from city to city does not always mean irregular attendance; but it does necessitate a greater or less educational readjustment, and frequent change of school is usually a cause of serious setback. The brighter pupils weathered

such changes remarkably well. One unfortunate child (Number 8) attended fifteen schools, and another one (Number 15) eleven! Yet each skipped two grades. In every case those of the superior group whose age of graduation is over eighteen have been retarded by frequent change of school, ill health, or by being out of school for various good reasons.

The record of the control group as regards regularity of attendance is not much different from that of the superior group. The reasons given for one or more terms out are also much the same. The total amounts of time lost through these absences are practically identical, namely, twelve terms by the superior group and eleven by the other. As regards health it has already been shown (see Chapter V) that the control group had the advantage. Certainly no one in this group was decidedly irregular in attendance because of ill health, and no one experienced anything like the number of family moves mentioned in the case of some of the superior children. Three of the "fairly regular" (Numbers 28, 38, and 43) were so simply because they have too indulgent parents who humored them in their wish to stay out of school without adequate cause. None of these three, be it added, will graduate from high school. Unsatisfactory in scholarship and conduct they have drifted away during their last semester.

Age at graduation from high school.—For the sake of a complete comparison the three young persons just mentioned have been included in computing age at graduation. Supposing them to have completed their last term's work in the usual time—which was quite unlikely—the two groups would compare in age of graduation as follows: superior group, median 17.3 years, average 17.5 years; control group, median 19.1 years, average 18.8 years. It is clear that the superior pupils are, as a group, distinctly younger at graduation than those with an average mental rating. The above figures are strikingly similar to those given in the former study of twenty superiors. (2) Others who have worked much with mental tests find this same high correlation between excellence in the tests and acceleration in school.⁵ Tables XV and XVI show that there are only nine, or 36 percent, in the superior group over eighteen when they graduate; but that in the

⁵ Unpublished data furnished by the Oakland Department of Research and Guidance showed this.

other group there are twenty, or 80 percent. The figures very likely underestimate the brighter group, for fourteen of them, as against five in the control group, have already graduated. This means that the dates for the rest of the pupils are merely estimates contingent on the work being completed this term, something of an uncertainty with some of the control group. It may be objected that this group has been at slight disadvantage because a few entered school late. This fact undoubtedly emphasizes the lesser intellectual "drive" of the duller group. Indeed two mothers stated that their daughters could have entered school earlier if they "had wanted to go." To prove beyond question that the superior children take less time to finish school, the average number of years required by those children in each group who entered at the first grade has been computed. The twelve-year course is completed on an average in 11.1 years by the more intelligent children, and in precisely 12 years by the others.⁶

Scholarship record previous to high school.—Precocity in the educational process was accompanied by superior achievement. The better quality of high-school work done by the superior boys and girls has been remarked (Chapter III). A similar superiority in the earlier grades is shown by Table XVIII, in which the notation described on page 13 is employed.

TABLE XVIII. AVERAGE MARKS IN ELEMENTARY SCHOOL

AVERAGE OF ELEMENTARY- SCHOOL MARKS	SUPERIOR GROUP			CONTROL GROUP		
	Boys	Girls	Total	Boys	Girls	Total
1	3	4	7	0	1	1
1—	8	3	11	2	2	4
2+	1	2	3	2	1	3
2	2	1	3	6	2	8
2—	1	0	1	2	1	3
3+	0	0	0	1	2	3
3	0	0	0	1	1	2
3—	0	0	0	1	0	1

⁶ Periods out of a half year or longer have not been counted as attendance. The method of reckoning slightly favors the duller group.

Records for the elementary-school grades were seldom available in the form of "report cards," but the young people and their parents were in such close agreement in their statements that the marks here given can be accepted as reliable evidence. It will be noted that eighteen, or 72 percent, of the superior group are rated as 1 or 1—, while only five, or 20 percent, of the other group are so graded. On the other hand, only four of the former group fall as low as 2 or 2—, while seventeen of the latter go as low or lower.

General and special intellectual ability.—Superior ability, in distinction from precocity, is a subject that lends itself less well to statistical treatment. We may point to better school marks but these do not half tell the story. It is suggested in certain recurrent phrases of parents and teachers, phrases that defy satisfactory quantitative classification. Here are some of them: "very quick and alert mentally," "eager for knowledge," "an original mind," "exceptional reasoning powers," "unusually large vocabulary," "mature point of view," "independent," "great power of concentration," "excellent judgment," "a clear thinker." And others: "well-informed on a great many subjects," "always wants an explanation for everything," "can do well anything she tries," "has always loved books," "quick to see the point." The reader is referred to the Appendix for a few brief individual descriptions. A fuller discussion of unusual ability will be included in the chapter following, which deals with interests.

It should be said at this point that intellectual ability was reported to be general not special. There are no cases of genuine one-sidedness in either group, according to the parents. In fact the superiors seem singularly "all-round," to use an expression of Terman, who finds the same thing. One mother said of her daughter, "All her teachers want her to specialize in their particular subjects because she does everything so well"; another mother stated, "Our boy seems to be very capable in every intellectual field that he enters." However, the attention is often focussed on certain interests and studies more than others, as will be shown later. Special talents, such as musical and artistic ability, do not concern us here.

Moral traits.—The information obtained about moral traits did not prove suitable for statistical treatment. It did, however,

support Terman's conclusion that intellectually superior young people are as a rule morally superior also. "Reliable," "dependable," "straightforward," "a fine fellow," were favorite descriptive terms used by teachers and parents. The writer heartily agrees with this testimony in so far as she knows the young people. Their cooperative spirit was quite apparent when it came to the details of the investigation. The same cannot be said for all of the control group. For instance, it took seven telephone messages, two letters, and a personal visit to extract the "questionnaire" from Number 28. Ten of the control group were reported to have undesirable traits of character. For the other group adverse criticism of character was negligible.

Summary.—The data presented in this chapter may be summed up as follows:

(1) Even in the first few years of life the superior children generally displayed some mental precocity and a degree of alertness in question-asking, memorizing, etc. not found in the control group.

(2) The brighter children showed decidedly greater ability, precocity, and spontaneity in the early learning process. They were conspicuously self-helpful in learning to read.

(3) Nearly three-fourths of the superior group have skipped from one to five half-year grades, but none have repeated any grades. On the other hand, a little over half of the control group have skipped from one to three grades, and over a third have repeated from one to three grades.

(4) Difference in the rate of progress of the two groups has been particularly marked in high school where the work is more difficult.

(5) In measures of central tendency the superior group is found to be over a year younger than the duller group at the time of graduation from high school. It is also shown that the former complete the twelve-grade school course in nearly a year less time than the latter.

(6) The intellectual superiority of one group is shown in part by their better school marks.

(7) Parents and teachers stressed the "all-round" ability of the superiors.

(8) The superior pupils were rated higher than the others in moral traits.

REFERENCES

- (1) Terman, L. M., *The Intelligence of School Children*, p. 170 ff. New York, 1919.
- (2) Yates, D. H., "A Study of Twenty High School Seniors of Superior Intelligence," *Journal of Educational Psychology*, 11:264-74, May-June, 1920.

CHAPTER VII

INTERESTS

Knowing something of the home environment and the physical, mental, and educational history of these boys and girls makes it possible for us to consider intelligently the question of their interests. To what objects, ideas, situations, etc., have they reacted with a feeling of decided interest? In what do the young people themselves think they have been most interested? In what do their parents think these children have been most interested? And more particularly, what specific evidence is there of any interest mentioned? Answers to these questions were obtained by means of a questionnaire (see Appendix) and through talks with the parents (and other relatives), teachers, and the boys and girls themselves.

Attitude towards school.—One of the first questions asked each mother was, "Has your child liked school?" It was explained that "school" meant the regular school studies and routine not including the extra-curricular activities, which all might be expected to enjoy. Degree of interest has been classified as in Table XIX.

TABLE XIX. LIKING FOR SCHOOL

DEGREE OF LIKING FOR SCHOOL	SUPERIOR GROUP		CONTROL GROUP	
	DURING ELEMENTARY SCHOOL	DURING HIGH SCHOOL	DURING HIGH SCHOOL	DURING ELEMENTARY SCHOOL
VERY STRONG.....	17	18	6	8
STRONG.....	3	3	4	4
MODERATE.....	5	3	11	10
SLIGHT.....	0	1	1	2
POSITIVE DISLIKE.....	0	0	3	1

This report, which was verified through the young people themselves, shows that the superior group has been greatly interested in school. Twenty-one, or 84 percent, have had a strong—generally very strong—liking for high school, and twenty, or 80 percent, felt the same interest in the elementary work. Nineteen, or 76 percent, have had a strong or very strong liking for school throughout the entire course. One boy only (Number 5) has been classified as having a “slight” liking (for high school). The situation is quite different with the control group. Fifteen, or 60 percent, have liked high school “moderately” or less, three positively disliking it. In fact, to only six, or 24 percent, has high school made a very strong appeal. Nor was the elementary work much more attractive to this group.

The reasons given for little or no interest in school are significant. The one bright boy who has liked high school only slightly has been an excellent student (the average of his marks in both elementary and high school is 1—), but he says that “other things are more interesting than school because you can think for yourself, and you don’t have to do things at certain times.” Those of the control group who have disliked school or have felt only “slight” interest in it, give quite different explanations. Number 38, a boy, says, “I always did hate school. I seemed to get lectures in class but hated to get down and study.” Another boy (Number 28) writes, “I don’t like books and lessons, but engines and everything that has to do with engines is the only thing that interests me much.” A third (Number 39), reports, “I guess I am just naturally a ‘bone-head,’ for most of the work in school seems uninteresting and hard to understand.” A girl (Number 29) explains that she never took much interest in her studies until recently because she preferred “to have a good time.” Another girl (Number 43) writes, “High-school studies are taught in a most uninteresting manner. I didn’t think the art teachers were good either and that is what I like best to do.”

Among the control group the causes of only “moderate” liking for school work may be classified as follows: (1) the pupil is chiefly interested in athletics or some manual activity, such as tinkering with an automobile, working on a ranch, etc.; (2) he is anxious to go to work and he sees no practical value in his studies; (3) he is taking a school course that is beyond his ability; (4) he

lacks decided interest in anything requiring real effort or exertion.

On the other hand school seems normally to arouse keen interest among superiors for in all the present cases where liking is "moderate" there is some good reason. Number 4 is much interested in high-school work, but he could hardly have been expected to show great enthusiasm for the badly taught elementary school in rural Texas which he attended. Number 23 spends most of his time after school hours earning to support himself, so he writes, "I should be interested in nearly every high-school study if I had the time to remain in school longer and study after school more." Number 21's deafness has kept her from a real enjoyment of school, though she says, "the subject-matter usually interests me." Number 20 "took school as a matter of course," her mother explained in referring to the elementary work, "and would have been more interested if she had not happened to be a little lonesome." Number 15's lukewarm attitude towards high school is the result of inadequate educational guidance at the beginning of her secondary course. She had found her earlier work extremely interesting. "But when she took high-school work her courses never seemed to fit," said her mother. "She would go to her teachers about it but was always being sent to some one else. Finally, a year or so ago, I told her it was no use, she had better give up trying to arrange things better, and just get enough credits to graduate." So this bright but diffident little girl lost her ambition for college in an over-large high school. She is the only one in the superior group who has taken the "general" course.

Liking for certain studies.—The report of general attitude towards school work is supplemented by specific information as to which studies have aroused unusual interest (question 2 of the Questionnaire). The two groups are compared in Table XX. The subjects are arranged in order of popularity among the brighter group without regard to relative percent. Science¹ leads with a decided majority, while manual work has only one votary. With the control group drawing (including design, commercial

¹ Physics or chemistry, or both, in sixteen out of seventeen cases. If both have been taken, both are usually named. In one case, when neither have been studied, general science and biology are mentioned.

art, and freehand and mechanical drawing) is most popular and mathematics least. A striking point of difference lies in the total number of subjects listed by each group, viz., fifty-three by the control group and sixty-six by the superior, i.e., about one-fourth more. This emphasizes what we have already noted in the preceding section, namely, the greater liking of the superiors for school work. Ten of them even volunteer the information that they have been greatly interested in *all* their studies, but none of

TABLE XX. SUBJECTS OF SPECIAL INTEREST

	SUPERIOR GROUP			CONTROL GROUP		
	Number taking this subject	Number unusually interested	Percent of those taking unusually interested	Number taking this subject	Number unusually interested	Percent of those taking unusually interested
SCIENCE.....	24	17	71	25	5	20
HISTORY AND ECONOMICS	25	13	52	25	8	32
ENGLISH.....	25	12	48	25	6	24
MATHEMATICS.....	25	7	28	25	3	12
DRAWING.....	12	6	50	13	11	85
MUSIC.....	13	4	31	15	5	33
LANGUAGES..	24	4	17	22	5	23
COMMERCIAL WORK.....	4	2	50	10	5	50
MANUAL WORK.....	7	1	14	9	5	56

the other group make any such statement. The subjects mentioned by the brighter pupils should be regarded as particular favorites rather than exclusive preferences.

Obviously the superiors incline toward the more "solid" subjects. Science, history, English, and mathematics form 74 percent of the total number of subjects exciting unusual interest. These studies make up only 41 percent of the total number of favorites of the control group, while 59 percent come under the head of drawing, music (choral, glee, and band), languages, com-

mercial work, or manual work (shop, cooking, sewing, etc.). It should be added that the five pupils in the duller group who have been unusually interested in languages, name only Spanish, which is considered the easiest. None of the four bright pupils especially liking languages mention Spanish, but speak of "languages" in general (two pupils), of French, and of Latin and French. It will be noticed that the number who have taken a given subject varies with the two groups by no more than two in any case except for commercial work, so the figures in the table for "number unusually interested" are fairly comparable as they stand. The course elected (college preparatory, general, etc.) can not have influenced the report materially, particularly as pupils take subjects and courses they like best, broadly speaking.

Reasons for preferences are best given in the pupils' own words. To quote from the written replies of some of the superiors:

"Physics and chemistry are the two basic sciences, and give one a knowledge of the why and wherefore of the workings of nature and of things in general."

"The logic in such subjects as plane geometry is very interesting."

"There seems to be a fascination in working problems, deriving formulas, and producing chemical compounds."

"I like to express my philosophy, ideals, emotions, and thoughts through the conversation of the characters in dramas I have written, and through essays (of which I have written many). I have also written lots of poetry." (This lad is sixteen!)

"I suppose because they (mathematics, chemistry, physics, and mechanical drawing) were all easy for me, and I always wanted to know just why anything was so, its cause and effect."

"I have always liked mathematics on account of the ease I have in working problems; history, because I like to read what great men did."

"I wish the newspaper to be my profession. These studies (journalism, short-story writing, civics, and languages) enlarge your vocabulary, but more important than that they enlarge your ideas of life. I think it is the duty of every citizen to know about the government and current affairs. Legal matters have always attracted me . . . I have had exceptional success in the writing of short stories in both grammar and high school. I like it."

"I have been unusually interested in trigonometry, mechanical drawing, chemistry, and physics because they require reasoning and are not merely a collection of facts to be remembered."

"I have been interested in stenography partly because I am going to earn my living by it, and partly because it is such an interesting subject. You can always learn something new about it. I am interested in history because it helps me understand present-day problems."

"I have been unusually interested in French, English, and Latin. I am very interested in tracing the development of English and in connecting it with Latin and French. I spend extra time on word derivation."

Some of the control group write:

"Although at times it has been hard for me, math. has always interested me and I always liked working out practical problems in it."

"I am very much interested in drawing and especially designing. These things seem to be easy for me naturally."

"I like Spanish because I desire to travel some day and Spanish is spoken in many countries."

"I don't know why but I always did like drawing. As for shop work, it was just natural to like machinery, etc."

"I have always been very fond of sewing and like office practice and history very much."

"I like art because I feel I have a certain amount of talent."

"I like music and Spanish because they have been easy for me."

"Music is very interesting, and because I play the piano, I find it a live subject."

"I have been unusually interested in shorthand, typing, current English, and business correspondence because I thought these subjects would help me when I left school."

"In designing there is always something very interesting to work out, and it is a help to me at home. I like typing because it is so different from other studies. I liked physiology because I learned more about myself and how to improve my habits."

These are thoroughly representative quotations. In the case of the control group the above list is almost exhaustive. Other replies practically duplicate these, or merely reiterate that such and such a subject is "interesting," or give no reason at all.

Interest in reading.—Interest in school studies is bound up with liking for reading in general. The latter was determined in two ways, viz., through questions 6 to 11 in the Questionnaire and by questioning the parents. According to the parents (their testimony was amply supported by other evidence) every single one of the superiors had shown an interest in books which was much above that of the average young person (cf. Table XXI). On the other hand, none of the control group had exhibited a like amount of interest. Thirteen, or a little more than half the group, were reported to have had average liking for reading, and six, or about a fourth, less than average. The remaining six were judged somewhat above average. Four of these (all girls) mention reading among favorite interests in answering question 10 of the Questionnaire (Tell what has interested you most, etc.), but they specify romantic fiction, generally of a very light order. Only one of the group (a boy, Number 31) was thought to be above average in his fondness for non-fiction. Question 9 (Give the names of books, magazines, newspapers, etc., which you have read during the past twelve months other than those read as required preparation for school studies . . .) brought out specific and detailed information as to the nature of subject-matter. Three boys of the control group say they have read no books at all (except, of course, text-books) during the year, and another one never reads any magazines. Two boys have read only one book apiece in twelve months. One girl never reads the newspapers.

All of the superiors have read magazines and newspapers regularly, and all but one (Number 23, who has to work most of his time out of school) have read books during the past year. One boy names only two books read in this period, but another writes, "I read an average of three books a week. As I do not study at home I spend my leisure time reading books and magazines." A girl names thirty-four authors whose books she has read within the year, and generally lists a number of works for each. Fourteen superiors (eight boys and six girls) particularly mention reading in giving their chief interests, and all of the group indicate their keen interest in books somewhere in their replies. Their answers to the question, "What kind of reading has interested you most?" show a wide range of subject-matter. Four even

specify that they have liked "all kinds of books and reading," as one boy puts it.

Let us consider the preferences in a broad classification. Twenty-two of the superiors mention fiction; twelve, scientific subjects (always more than just practical mechanics); eleven, current events and general information; eight, history; and six, poetry. The control group name fiction twenty-two times, current events and general information, twelve times; scientific subjects (only practical mechanics in four cases), seven times; and history and poetry twice each. This classification, however, is not sufficiently inclusive nor detailed to show the number and extraordinary variety of the topics listed by the brighter group. Judging by their descriptions and examples the quality of their reading is decidedly better. There is a greater proportion of standard and classic fiction in their lists and much more non-fiction.² Sixteen of them like to read the encyclopedia even when their school work does not require it. Only seven of the control group read it voluntarily and these "only once in a while." The eagerness for knowledge that characterizes the superiors and their wide range of interests are well expressed in their own words:

"Reading is my favorite occupation; not so much for the pleasure of the thing itself, however, as for what I may learn by it. I like to read articles on the sciences especially. Sometimes it will be one subject, sometimes another. My taste varies. It is therefore practically impossible for me to say in what subject I am most interested. Some time ago it was astronomy. At another time it was psychical research (*not* spiritualism). Lately it has been wireless telegraphy. I am also interested in such subjects as archeology, paleontology, and history. For fiction I like especially Kipling, Bulwer, and the like. Lately, I have been reading H. G. Wells. His books are rather out of the ordinary."

² The following list of books read by a superior boy within the year is not one of the longer ones but illustrates the point: Churchill, *Inside of the Cup*; Mark Twain, *Letters and Essays*; Gayley, *Poetry of the People*; E. O. Jordan, *Food Poisoning*; Gulick, *The Efficient Life*; Bennett, *How to Live on Twenty-four Hours a Day*; *The Philosophy of Art*, [author not given]; Tagore, *The Post Office*; Zangwill, *Nationalism*; Tagore, *Nationalism*; Pillsbury, *Psychology of Nationalism*; Ross, *Social Psychology*. It may be compared with this representative one given by a boy of the control group: Rex Beach, *The Iron Trail*; Van Loan, *Taking the Count*; Jack London, *House of Pride*; Bower, *Star of the Desert*.

"I enjoy reading about Newton and Einstein theories, and about astronomy and things like that. I enjoy working over mathematics, mathematical fallacies, and puzzles. I help all the other fellows in math of all kinds when they get stuck, especially in geometry. I like to read all kinds of books, and reading is my great indoor pastime." In telling the kind of reading that has interested him most this boy lists, "mechanical and scientific books of all kinds, current events, history, general information, poetry *not sentimental*, adventure, business, love stories, politics, religion. . . . I use the encyclopedia whenever I find an unknown subject in my reading. I don't prefer any one subject especially but I like to use it to keep my knowledge well-rounded and not lop-sided. I suppose that if I do prefer any at all, it is something along the lines which I know the least about, that is, probably history, philosophy and along that line. There is nothing I like better to do than to take an encyclopedia, open it, start reading, going on each different subject as it comes up in the reading and all the references at the end of the article. I do not have time to do that as much now as I used to do four years ago and thereabouts."

A girl who is reading many classic authors writes, "I am trying to read all their stories so that I will be able to speak intelligently on famous authors."

"All my life I have been fond of reading. . . . I am always happy when I am learning something."

One boy writes that he has been most interested in reading "poetry, character studies, analytical stories, books and articles on philosophy, psychology, physiology, chemistry, pharmaceuticals, therapeutics, theology, electricity, physics. . . . I read the encyclopedia in order to add to my general knowledge. In my note-book I have a list of subjects about which I know but little. Whenever I have time I look them up in books or the encyclopedia. . . . The subjects I prefer (in the encyclopedia) are hard to state because all knowledge is about equally acceptable. However, in order to give you an idea of the information I obtain in this manner I will give a list of some of the subjects which I have read in the encyclopedia in the last few months: soap making, vaccination, small-pox, tuberculosis, and the blind."

It is probably needless to add that no such statements are made by any of the control group.

A definite quantitative expression of the amount of time usually given to extra-curricular reading was obtained through question 8 (q.v.). The superiors report from one and one-half to twenty-four hours a week thus spent; the control group, from one-half (or less) to twelve hours. The average for the former is 10.0 hours; for the latter, 4.7. The twenty superiors studied before averaged 8.9 hours a week, the control group is that case 5.1 hours. These comparisons reinforce the other evidence that the exceptionally intelligent are much greater readers than ordinary young persons.

Home duties and paid employment.—It might be objected that the amount of leisure time at the pupil's disposal may have influenced these data and possibly the number of avowals of interest in reading. If the duller boys and girls have had to spend much more time after school hours in working, the striking difference in time devoted to voluntary reading might indicate little in regard to natural inclination. But it will be remembered that the control group is even somewhat superior to the other in economic status so no greater necessity for paid employment is apparent. For the sake of specific information every pupil was asked (Questionnaire, question 15) to tell the nature and extent of all home duties and of all paid employments outside the home that he had ever had, giving his age when he began and ended each, and the average number of hours a week spent on it. The young people are often too uncertain about the amount of time taken by home duties to attempt estimates, but those that are given indicate little or no difference between the groups. By adding the years or months of paid employment of each pupil it is possible to compare the average working period of the two groups. The greatest total amount of time given to outside employment by any of the superiors is six years; by any of the control group, eight years. Six girls in the former group and four in the latter have never been employed, but all the boys have. The average for the superior pupils is 2.24 years; for the others, 2.60 years, i.e., a difference in central tendency of only about a third of a year (.36). This small longitudinal variation certainly does not indicate that paid employment has absorbed the attention of one group much more than the other.

From the standpoint of number of working hours during times of employment the difference between the groups is extremely

small. Averaging the average number of working hours a week we find that the superior pupils average 26.7 hours (i.e., 4.4 hours a day in a six-day week), and the others 27.4 hours (i.e., 4.5 hours a day). Employment within and without the home cannot, then, be offered as an excuse for the lesser amount of time given by the duller pupils to voluntary reading. Nor is this accounted for altogether by the time spent in home study, which averages 8.4 hours a week for the superior pupils and 11.2 hours for the others, according to their estimates. That is, there is a difference between the groups of 2.8 hours, which is not proportionate to the difference in time spent on other reading (5.3 hours as shown in the last section).

Ratings on types of interests.—The parents were asked to rate their children on degree of interest under six headings, viz., (1) reading, (2) objective things, (3) sports, (4) music, (5) art, and (6) people. Earlier experience had proved this classification to be sufficiently inclusive. The first class, reading, has been discussed. The term "objective things" applies to things and activities with things—such as tools, animals, sewing, cooking, gardening, and the like—in distinction from books and intellectual interests. Under "sports," which really forms a sub-class of objective activities, are included games, athletics, and out-of-door recreations like "hiking" and camping. "Music" and "art" are self-explanatory terms. Interest in "people" means gregariousness, and interest in persons and social situations. The mothers were required to base their judgments on "behavioristic" evidence, that is, the young person's liking for any particular field was gauged by amount of specific performance rather than verbal expression of interest. In a few cases when parental evidence was not satisfactory corrections have been made in the ratings. In reality two judgments were given, one for the elementary-school period and the other for the high-school years, but the ratings seldom differed. An average was taken when necessary. The five-point scale was again used, 1 signifying much above the average young person; 2, above the average young person; 3, average; 4, below, etc.; and 5, much below. Table XXI shows the distribution.

The two striking facts shown in Table XXI are (1) the superior pupils' marked interest in books, which was discussed earlier in the chapter, and (2) the fact that the brighter young people, collectively speaking, are as much interested as the others, or

more so, in every field except art. Fifteen, or 60 percent, of the superiors and thirteen, or 52 percent, of the control group have been decidedly interested in objective things, and activities other than sports (ten superiors and eight of the others, very much so). Not one of the superiors is rated below average in his liking for sports, though two of the control group are thus rated. With regard to music it would not be fair to say that either group has the advantage. The brighter one is rather more interested than the other in people. This report certainly belies the statement often made that the bright child is only interested in books. It is rather that he has *more* interests than other children, and reading is generally the favorite.

TABLE XXI. RATINGS ON TYPES OF INTERESTS

RATING	READING		OBJEC- TIVE THINGS		SPORTS		MUSIC		ART		PEOPLE	
	S	C	S	C	S	C	S	C	S	C	S	C
1	25	0	10	8	6	6	6	5	5	5	5	2
2	0	6	5	5	4	6	6	9	4	6	6	4
3	0	13	6	10	15	11	10	8	5	6	11	15
4	0	6	4	2	0	2	3	0	7	4	3	4
5	0	0	0	0	0	0	0	3	4	4	0	0

("S" stands for "superior"; "C," for "control".)

A comparison of the activities listed by each group of pupils as their chief interests shows clearly a quantitative and qualitative difference that may be illustrated by some quotations:

(Boy of superior group) "I have always been interested in making things. When I was about three years old I was given a hammer and saw, so I learned how to use them early in life. When I was about six I was given a tool chest and with the tools I made ladders, coasters, etc. When I was ten years old I was given a Meccano set. This interested me very much and when I tired of the twenty-four models described in the manual, I set off on my own hook and created new models. I even rigged up an affair by which the front door could be opened from the kitchen. I was

given a book called *The Boy Mechanic*. It told how to make hundreds of little things. I succeeded in making quite a few of them

"Better than making things, I like to plan them in my mind. I sometimes spend my leisure time for weeks thinking a plan through from beginning to end, even though I see no hopes [for financial reasons] of ever making the things. In this way I have thought out plans for several kinds of cycle-cars and many motor-boats."

(Boy of control group) "Anything that has to do with machinery or the like attracts my attention. When quite a youngster, such things as toys, as trains, were very fascinating to me and I liked to take apart and put together the toys. I take much care and interest in our automobile and seem to understand the machine thoroughly."

(Boy of control group) "I never have been very much interested in anything particular at any time."

(Girl of control group) "I suppose I might be called an all-round person, liking school, reading, sewing, dancing, going to shows, etc. . . . I am very fond of home life. As a little girl I always enjoyed playing house and school. To be a teacher was then my greatest hope. But I guess that was just a passing fancy. I am very fond of sweets and enjoy preparing them, such as making candy."

(Girl of superior group) "Anything in connection with athletics or science and mathematics interests me greatly. . . . This term I have been particularly interested in social service work. The —— Club that I belong to has helped me in this. Going out among people is what drew my attention to what ought to be done and our advisor has tried to show us how to do it. . . . I like school-work but I also like the outside activities that go with school. . . . My chief interests and ambitions are to become a surgeon and to have lots of good friends."

Qualities of social leadership.—Seven, or 28 percent, of the superiors have shown genuine ability as leaders, i.e., they have been class presidents, organizers of clubs, etc. That they have been much interested in these social activities goes without saying. Three, or 12 percent, of the other group have been equally prominent, and four, or 16 percent, have held less important positions. Twelve, or 48 percent, of the brighter pupils have also had such

offices. Two superiors are so much interested in other things—scientific study particularly—that they have deliberately avoided prominence.

Summary.—With regard to interests it has been shown that:

(1) The superior group has been greatly interested in school, the control group much less so.

(2) The former has been especially interested in science and the more “solid” studies; but drawing has proved the most attractive school subject to the latter.

(3) All of the brighter pupils have been unusually fond of reading and a great deal more so than the other young people. The former have been eager for all sorts of information, and they show by the books and articles they have read a remarkably wide range of interests. As a group they spend on an average over twice as much time as the others in extra-curricular reading.

(4) This difference is not because the duller pupils have to spend more time at work. It is true that they have had on an average a little more paid employment outside the home, but the average number of working hours a week for each group is practically the same.

(5) The control group has given more time to home study but not a sufficient amount to account for the difference between the groups in voluntary reading.

(6) The brighter young people, collectively speaking, are as much interested as the others, or more so, in objective things and activities, in sports and athletics, in music, and in people and social situations. Art is the only field in which the duller group has the advantage.

(7) The superiors more often show qualities of leadership.

CHAPTER VIII

CONCLUSION

The purpose of this chapter is to present certain conclusions indicated by the results of the investigation and to make some recommendations with regard to the education of superiors. The findings of a previous study of twenty superiors agree with this one on all the more important points and lend them decided additional validity.

We have found that general environmental conditions have been much the same for both groups. Little difference between them was shown when home conditions were ranked by a carefully standardized scale. Most of the young people have always attended public schools. The two groups have given about the same amount of time, on an average, to paid employment outside the home. With respect to health the duller group, on the whole, has excelled the other, but it is quite unlikely that the superiors should be considered below the average. The latter, however, have been more precocious physically and mentally. It is very probable that they come of more intelligent stock, but complete information concerning heredity could not be obtained for the parents themselves were often ignorant in the matter. The decidedly greater native ability of the brighter group showed at all ages. It was apparent in their learning to read earlier, in their better school marks, in their more rapid progress in school, especially high school. But more particularly it showed in an intellectual spontaneity, a keen desire for knowledge, and a wide range of interests.

Naturally they have turned to books to satisfy their craving for knowledge. All of this group have been great readers. The duller group, on the other hand, have had a much narrower range of interests and no more than ordinary liking for books. School has appealed to them much less. The evidence with regard to extra-curricular reading—books and magazines read, nature of the subject-matter preferred, time spent on reading, and so forth—

showed a striking difference between the two groups. One is satisfied with light fiction or a very moderate amount of informational literature of a popular sort; the other not only reads the best of fiction but also seeks knowledge of all kinds and eagerly investigates every new subject. Their interest is not in books alone, however, for they have been as much interested as the duller pupils, or more so, in objective things and activities, in sports and athletics, in music, in people and social situations—in short, in everything except the field of art, which requires special talent that the duller group happen to possess more abundantly.

A bigger response to the environment, a catholic interest in everything, is what particularly characterizes the superiors. Their reading is "not so much for the pleasure of the thing itself," as one boy puts it, but for what may be learnt thereby. No wonder scientific subjects have a special attraction for them. They seem, like Francis Bacon, to have taken all knowledge for their province. There is a vast difference between the groups in point of view. The superiors look for ultimate principles, causal explanations, final objectives; the other group do not seek beyond the immediate, the practical, the concrete. In terms of use to society this difference is vital. One type of individual has only narrow, personal aims, and can "see no use" in the larger curiosities of the brighter mind. And yet, these very searchings after truth are the cause of human progress. It is from the superior minds that new scientific and social truths emanate.

Fortunately for society exceptional intelligence is generally accompanied by superior moral characteristics and often by qualities of social leadership. The brighter mentality is apt to meet issues of all sorts squarely. It is regrettable that there is not more opportunity in our schools for the exercise and development of leadership. The chief obstacle is the large high school, where the superficial capabilities of a catch-the-eye type of young person often overshadow the less showy qualifications of superior boys and girls. The small school is much more successful in bringing the latter into prominence.

The mistake should not be made, however, of believing that every young person of exceptional intelligence should be a leader along *social* lines. This is the short-sighted view of many teachers,

who seem to have in mind a single standard of perfection to which all pupils must be urged to conform. Such a policy does not serve the best interests of society. There are many kinds of superiority, and not all are social, nor should be social. The Edisons and Einsteins of the world seldom go among men. It will be remembered that two boys of the superior group deliberately avoided positions of leadership, though they were much criticized by their teachers for so doing. They are both remarkable boys and it is not improbable that one of them at least (Number 1, see Appendix) will one day make some contribution to science, which is the field that interests him most deeply. Such a pupil is doubtless best left in peace to develop his abilities without undue distraction. Youth should indeed be a time for finding oneself. It may be that the development of qualities of leadership should simply be postponed until a later period. Pedagogically the difficulty lies in knowing when to encourage a young person towards leadership and when to leave him alone. Only excellent judgment can decide the matter. Fortunately many superiors have a strong instinctive feeling of what is best for them and may be safely trusted to work out their own destiny.

The key-note in the education of an exceptional child of any age is to provide a full and wholesomely stimulating environment. New objects, new activities, new ideas must be presented. If his intellectual horizon be narrow, he will fritter away his time on trifles. We have noted especially (page 49) one striking case of mental stagnation resulting from too few demands on the intelligence.

The superior child needs a superior teacher. The prime prerequisite is a large fund of knowledge, common sense, and sympathy. The right kind of teacher will not waste the child's time on unessentials or in unimportant routine. His need for intellectual freedom will be recognized and his natural independence of thought will not be suppressed, for the exceptional child, above all others, must be allowed to develop his individuality. The teacher's opinions should not be forced upon him. The real objectives of study should be made clear, and care should be taken to avoid creating what Kipling calls "a lust for mere marks." Tolerance in point of view and emphasis on things that are important should characterize the instruction.

It would seem as if the pedagogy of superiority were largely negative. This indeed is true. Not the least of *any* good pedagogy is knowing when *not* to interfere, and with superiors this is a vital point, for the exploring tendency of the exceptional mind needs full play. There is, however, a positive side as well. The teacher should be on the lookout for indications of mental stress and strain and be ready to offer encouragement or advice. The high-school pupil especially has reached a period when he is sometimes desperately in need of a mature friend to help him out of some intellectual tangle. The teacher should be such a friend. The teacher should also stimulate the pupil with new ideas and suggestions and should inspire him to his best efforts. The laws of mental economy and efficient use of the mind should be pointed out, for superiority should be conserved in every way.

Details of pedagogical procedure can not be discussed here for there was no attempt made in this investigation to study classroom methods. Special classes for superiors are suggested, and doubtless rightly, by others interested in the subject. If there were special classes, unusually competent teachers would presumably be chosen for them. In the light of the value to society of superior ability we could hardly afford to do otherwise. It is unfortunate in one way that bright pupils weather pedagogical mistakes so well, for we are tempted to think that there are none. Because the exceptional child gives so little trouble to his teachers and generally does such satisfactory school work, we suppose that all is well. We forget to measure results in terms of potentialities. Because a boy does well in school does not mean that he is getting the largest returns on his investment of time and energy.

A number of writers have called attention to the habits of indolence and laxity that may be developed in children of exceptional ability who do not have full opportunity for the use of their powers. Another type of bright child to whom an injustice is also done has been overlooked heretofore. This is the gifted but over-conscientious child (usually a girl), whose marked ability is often concealed and hampered by excessive industry and over-scrupulousness. Petty requirements and the drudgery of routine are allowed to obscure the larger aims of study. Such misplaced emphasis may form bad mental habits that persist through life.

Superiority is conspicuous for its complexity. Though there are certain general characteristics peculiar to all superiors, each one is a case by itself. In the high school especially there is often great need for study of individual superiors in order to avoid misunderstanding and unsympathetic judgment. When exceptional intelligence is not recognized nor understood there is often great wastage of talent. An important use of mental tests should be to discover cases of decided ability that the teacher overlooks. While intelligence tests agree fairly closely with both school marks and teachers' estimates there are always some superiors who are underestimated by the latter criteria. Number 13 (see Appendix) illustrates the point. A few of his teachers have known that he is very bright, but most of them have failed to appreciate the fact because he does not "conform" to school ways. He graduated but was not "recommended" for college. There is every reason to think that an earlier mental test, with a sympathetic handling of the case, would have prevented much unhappiness for him and his parents. Number 23 is an example of a boy whose ability was fully recognized, but who was misjudged as selfish and anti-social because no one knew of his home conditions and the grave necessity for giving all his time to study or work, a necessity that kept him from any participation in school activities of a social nature. This reticent, conscientious lad felt that he owed his foster mother a debt of gratitude that could only be repaid by persistent application to his school and other duties.

Adequate educational guidance should be provided at the outset of the high-school course and throughout. There are a number of examples of misdirected courses among the superiors studied. One girl has completely lost interest in going to college as a result of gross lack of educational guidance. Not infrequently a young person's course has to be changed after two or three years of high school, and this always works a hardship to the pupil that could have been avoided. One of the duties of an educational guide should be to see that every superior is properly informed as to the necessary requirements for college and to advise him strongly to go there. Any cases of superior pupils not liking school should be carefully investigated.

Any vocational guidance offered should not be inconsistent with the superior young person's need for a thorough general

training before specialization is begun. The superior girl presents a special problem in vocational guidance. The practically unanimous report was that she "does not like housework" but "is fond of children." Unhappiness is in store for her if she marries without provision for some work besides household duties. Insufficient exercise of superior natural abilities is a genuine hardship and often a source of positive misery. The difficulty is to find the kind of work that is compatible with a woman's duties in the home.

These are merely a few suggestions offered towards the conservation of superiority.

APPENDIX A

CASE STUDIES OF THREE SUPERIOR BOYS

(These individual studies are added to make clear some of the traits of superiority. The first boy is an example of the more brilliant type of superior. The second is much less remarkable. The third case suggests certain pedagogical problems.)

Number 1: At eighteen made a score of 191 in the Army Alpha test, the next highest score being 178; tested 333 in Stanford test, the highest score being 346.

An only child. Father, owner of a cigar-store, died of pneumonia at twenty-five, when the boy was only three years old. Ancestry on father's side somewhat superior; on mother's side probably average. Besides all the "children's diseases" (measles, mumps, whooping-cough, and chicken-pox), the boy has had chorea, pneumonia, glandular trouble, and an operation on the mastoid process. All these illnesses have been severe, and the boy has been decidedly irregular in school attendance. In spite of this and the fact that he has attended school in six different towns, he has never repeated a grade, and has three times been promoted on the strength of only a few weeks' attendance. His school marks have been 1's or 2's—generally 1's. In high school his general health has been very good.

He began to use words in sentences at 13 months. At three years could say about forty Mother-Goose rhymes. As a little child he asked a great many questions and "wanted to get to the bottom of everything." His mother says that she was not well enough educated to answer his questions very well, and that as a widow she was the family bread-winner, so the boy has not had even ordinary advantages at home. He learned to read at school and has always been "very, very bookish." When he developed chorea at the age of eight his mother wanted to take him out of school, but this suggestion distressed him so that she let him stay. Poor health and an eagerness for books and knowledge kept him from play and the society of other children. In grammar school he distinguished himself in debate but refused to continue the work in high school because he said it would waste his time. He has always been fond of music but has not wanted instruction because "there are too many serious things to be found out." He had only one chum as a younger boy, and has just one now. But he is eager for the society of intelligent adults and can discuss socialism, politics, scientific theory, and many other subjects with remarkable astuteness. If he finds himself poorly informed he will discontinue the discussion until he has gathered all possible information. Sometimes he will spend days hunting for data to prove a point. Often he displays a keen, caustic wit. He takes no part at all in school athletics, though he is fond of "hiking" and boxing. He has never had the slightest interest in making money, but has done it as a necessity. Prefers to be shabbily dressed so that he can save his money to buy certain *éditions de luxe*. Though he shows decided all-round

mental ability, for several years he has been particularly interested in things scientific. Last summer vacation he gave nearly all his leisure time to a study of astronomy. Home study takes so little of his time that he can give much attention to such things as his wireless outfit, experiments in physics, reconstructing a Ford car, and wide reading. During the last four years he has constructed a "wireless," a hygrometer, a copper-wire thermometer, a "buzzer telegraph," a toy submarine, and some compound microscopes, all of which "worked." He has written for the school magazine. He also does excellent work with tools. As his mother says, "Anything he does, he does well."

He is anxious to go to college but has no plans for the future other than a desire to study as much as possible especially along scientific lines. He says he will know better in college what he wants to do afterwards.

His teachers have always observed his exceptional mental capacity. To quote a high-school teacher, "He is the brightest pupil I ever taught, and especially remarkable for his profound grasp of a subject." Space forbids further description except a few other adjectives that have been stressed in describing him, "independent," "determined," "not sociable," "absolutely trustworthy."

Number 2: At sixteen scored 346 in the Stanford test, the highest score made; Otis test 155.

Father a lawyer. Both parents college graduates. Boy has two brothers, who are just as bright; his sister is not so bright. Ancestry on both sides superior. The maternal grandfather was a distinguished judge. Boy had the children's diseases and a light case of diphtheria, but up to sixteen his general health was very good. At that age he had inflammatory rheumatism severely, followed by chorea.

He began putting words together in short sentences at about fifteen months. At five years he began to be taught at home by his mother. He learnt very readily and could read well in a few months. At the end of his fifth year he had completed practically two years of school work. At six he entered the second grade at school. In spite of schooling in three states (five schools) and two years spent at a little country school, the boy has managed to skip a grade and would have graduated at sixteen and a half if illness had not overtaken him. His school marks have always been 1's or 2's, though he has never given much time to home preparation.

L. is an example of excellent general ability. Even his mother says this, though she has not considered him especially remarkable, probably because of the high standard for comparison created in a thoroughly superior family. As a little child L. asked very intelligent questions and often came out with a thoughtful explanation of his own. He early learnt to amuse himself with books, but had the play interests of a normal child, too. Later he became an enthusiastic and prominent Boy Scout and has always loved out-of-doors and his garden. He is skillful with tools. All his school work has interested him and his teachers rate his ability as very superior. Both his mother and his teachers stress his power of reasoning, capacity for concentration, independence in studying, wide range of general information, and excellent vocabulary. "Before I had completed the sixth grade (ten to eleven years)," he writes, "I was able to work any problem in the arithmetic," in other words to do perfect eighth grade work. He says that science and history appeal to him because they have a causal explanation to offer and "enable one to think out better adjustments for mankind" (to quote him). He is in the habit of keeping far ahead of the classes in physics and chemistry. He would like to be a chemical engineer.

The really remarkable thing about L., however, is not any spectacular idiosyncrasy, but his ability to do his school work excellently and to mix with his fellows and yet to carry the burden that his home has put upon him as eldest child in a family where the mother has been bed-ridden for several years. Since domestic servants are almost extinct and the father is very busy, L. does an almost unbelievable amount of household work—among other things most of the cooking, buying, and managing. Fortunately his is a very loving and appreciative family. "He is always a comfort and a joy," his mother says. "His judgment is so good and he is so reliable and sensible that I am afraid we let him do too much, though it seems unavoidable." L. is a very lovable boy, liked by everybody.

Number 13: At sixteen scored 333 in the Stanford test, and 149 in the Otis.

Father a prominent oculist and a clever man. Boy has two brothers who are not so bright as he, and an exceptionally intelligent sister who is quite his equal. Ancestry on both sides superior. Boy's health excellent.

At two the child was put in charge of a German nursery-governess. His mother (who gave him little personal attention at that time) does not think he could put words together in short sentences until he was three when he had learnt to speak German. At five he could read and write English and German and add and subtract. He entered the "high" third grade when he was nearly seven. His elementary-school marks average 1— and his high-school marks 2—. But the average of high-school teachers' estimates is only 3+. It is quite likely that there is a great deal of truth in what a teacher, who has known him for years, says of him: "He is an example of the doctrine of interest gone to the bad." Personally he is a very likable lad with uncommonly charming manners, but during most of his high-school course he has been something of a problem to his teachers. A visit to the home explained much. Plenty of money, no necessity for doing things at certain times, no demands made on him at all—and two doting parents. It is really surprising that the boy does not make a worse showing for he has been allowed to follow his inclinations to his heart's content and there has been an ever-present parent to fight his battles—to *insist* upon doing so—if anything goes wrong. Nothing has gone *very* wrong (he is thoroughly honorable and not naturally prankish) but R. has a wonderful faculty for "never hearing when the notice was read," for forgetting to hand in his note-book, or failing to be in the proper place at the proper time, in short, for doing just about what he pleases with a glorious disregard for rules and regulations. He has a remarkable laboratory of his own, which he has largely made and equipped himself—often spending his "lunch money" on apparatus and chemicals—and many a time he will work there until two in the morning—but not on the experiments due next day! His reading covers an exceptionally wide range of subjects, but he is quite likely to be engaged in an intensive study of Einstein when he should be preparing for an examination in literature. He busily pursues his own ends regardless, for the most part, of criticism or interference.

APPENDIX B

QUESTIONNAIRE

INTERESTS

1. Go through the following list of studies and mark every one that you have taken in the way you are directed under "a" and "b" below. Mark only the studies you have taken. Follow directions carefully. Erase and change as much as you please.

a. Underline 3 times those that have interested you most.

Underline twice those you have regarded indifferently.

Underline once those you have disliked.

b. Mark at the side with 3 crosses those you have found the easiest.

Mark with two crosses those you have found neither very easy nor very difficult, that is, about average.

Mark with one cross those you have found the most difficult.

English	Commercial Arithmetic
Social Problems	Shop Mathematics
Economics	Trigonometry
Algebra	General Science
Geometry	Chemistry
Commercial Law	Physics
Accounting	Botany
Biology	Stenography
Physiology & Hygiene	Typing
Civics	Bookkeeping
American History	Office Practice
Ancient History	Shop Work
Modern European History	Freehand Drawing
Medieval History	Mechanical Drawing
English History	Design
French	Dressmaking or Sewing
German	Millinery
Spanish	Home Economics
Latin	History of Music
Salesmanship	Music (Choral, Band, etc.)
Advertising	Physical & Commercial Geography

Add any other subjects you have taken.

2. In what studies have you been unusually interested? _____

Why? _____

Do you give any of these unusually interesting studies a greater amount of time,

thought, or study? If so, tell what you do _____

3. Name any school subjects that you have not taken in which you have a particular interest: _____

4. Name the subjects that you would be most interested in studying in college: _____

5. Do high-school studies, generally speaking, fail to interest you particularly? If so, why? _____

6. What kind of reading has interested you most? For example, have you preferred love stories, stories of adventure, stories of home life, sentimental poetry, books and articles on electricity, wireless, business, religion, history, gardening, housekeeping, politics, current events, general information, etc., etc. Mention several kinds if you wish, *in the order of your preference if you can.* _____

7. Do you ever read the encyclopedia except when you need to for your school work? If so, why and how much? _____

What subjects do you prefer? _____

8. About how many hours a week do you spend in reading which is not required by your teachers? _____

9. Give the names of books, magazines, newspapers, etc., which you have read during the past twelve months other than those read as required preparation for school studies. If you can not remember names of books give the author and about the number of his books you have read this year. If you have forgotten both title and author, tell the general subject-matter of the book (fiction, electricity, etc.) and the number of each kind read. Write "regularly" after the names of magazines or newspapers which you have read fairly regularly. _____

BOOKS		MAGAZINES	NEWSPAPERS, ETC.
Author	Title	(Both monthly and weekly)	

(Write on the back of page if necessary)

10. Tell what has interested you most, that is, what have you liked best to do and to think about, what things or thoughts or activities have aroused your greatest interest.

Perhaps you like reading and studying best. Perhaps sports and athletics are your keenest interest; or music and embroidery. Perhaps you like to think and read about certain subjects such as electricity, mathematical problems, inventions, evolution, or religion.

Here are parts of replies from two pupils in another town: "I like to work at mathematical problems and have ever since I was 8 years old when I did problems in arithmetic that nobody else in the class could do. When I was about 10 my uncle gave me a book of puzzles that were mostly mathematical, and I found them so interesting that I did them in most of my spare time for several months. Math is a sort of game to me, not always easy but very interesting. In high school I have generally worked ahead of the class in algebra and geometry and like the originals in geometry especially. I suppose I have spent on an average, during high school, about a half hour a day on math work I didn't have to do for the next lesson" etc., etc. "Next to dramatics and tennis" (we shall omit the writer's description of these interests), "I have been most interested in some subjects that have come up in connection with my lessons. I read something in my history, when I was a Freshman, about a philosopher called Kant. I looked him up in the encyclopedia and found out something about other philosophers and their beliefs. I have tried to learn all I can about such things and have been intensely interested. I am afraid people will laugh at me if I tell them so I just talk it over with my chum and have resolved to take Philosophy in college." Etc., etc.

Below and on the accompanying blank sheet describe your own interests carefully and in detail. Give your interests before you entered high school as well as the later ones. Remember *I want to find out what had really interested you most. In every case tell (1) how old you were when you began to be interested, (2) who or what started your interest, (3) how intense it was, (4) how long it lasted, (5) anything else you can think of about these interests.* If you are an "all-round" person, liking school work and play and nearly everything else about equally, say so, but tell what interests you most if you can.

11. What things have you made, invented, or constructed yourself, or what have you accomplished in any creative way? Make a complete list.

Examples: built canoe, made a dress, wrote short story.

Give your age at the time, and tell whether the thing was a success, that is, was it usable, or wearable, or was it printed or good enough to be printed, etc., etc.

ACHIEVEMENT	HOW OLD WERE YOU THEN?	WAS THE THING A SUCCESS?
1.		
2.		
3.		
4.		

ACHIEVEMENT	HOW OLD WERE YOU THEN?	WAS THE THING A SUCCESS
5.		
6.		
7.		
8.		
9.		
10.		

12. Name all the school offices, positions, or honors you have ever had, such as class president, reporter on school paper, member of high scholarship societies, band, baseball team, debating club, school committees (what?), or actor in plays (what parts did you have?), etc. Give a complete list.

POSITIONS	HOW OLD WERE YOU WHEN YOU BEGAN?	HOW LONG DID YOU KEEP IT UP?
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		

13. Name any other activities or organizations—clubs, societies, teams, etc., such as Y. M. C. A. teams, Christian Endeavor, Campfire Girls, small clubs—in which you have ever taken part.

ACTIVITY	HOW OLD WERE YOU WHEN YOU BEGAN?	HOW LONG DID YOU KEEP IT UP?	WAS THIS ORGANIZED OR MANAGED BY YOU?
1			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			

14. Name achievements or activities not yet mentioned, such as appearing in recitals or concerts, printing a child's newspaper, wiring your basement for electric lighting, winning a prize or medal (for what?), etc.

ACHIEVEMENT	HOW OLD WERE YOU THEN?
1.	
2.	
3.	
4.	
5.	
6.	

OCCUPATIONS

15. Tell the nature and extent of all (a) paid employments outside your home and (b) home duties you have had.

A. EMPLOYMENT OR JOB OUTSIDE YOUR HOME	HOW OLD WERE YOU WHEN YOU BEGAN?	HOW MANY HOURS A WEEK ON AN AVERAGE?	HOW LONG DID YOU KEEP IT UP?
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
B. HOME DUTIES			

16. What do you plan as your chief occupation in life?

17. What led you to this choice?

18. If you have not decided on your vocation, what lines of work are you considering?

19. If your choice is not your real preference, what would you most like to do? If you are a girl and would prefer the home duties of a married woman as your vocation, please say so _____

20. If you have made a decision as to your future occupation, at what age did you decide?

